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Corporate tax reform to help address Australia's weak investment performance

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Executive summary

Our 2019 report on Australia's corporate tax system was titled *Australia watches the train go by*. Australia has already missed the train.

Investment, which is one of the key factors leading to per capita economic growth, has trailed poorly since 2015, one of the worst records among OECD countries. While many factors influence investment, Australia's lack of company tax competitiveness is one that explains its relatively poor performance.

At 30 per cent, Australia has the third highest company income tax rate of OECD countries in 2021, slightly below Portugal and Japan (and tied with Germany and Mexico) and well above the OECD GDP-weighted average of 26.3 per cent. It also has the third highest effective tax rate on marginal investments once accounting for differences in company tax write offs and other taxes on capital investment (such as stamp duties, real estate transfer taxes and capital levies). Australia's effective tax rate on marginal investments is 28.1 per cent, three points higher than the G20 GDP-weighted average of 25.1 per cent and almost four points higher than the OECD GDP-weighted average of 23.8 per cent.

This reports also looks at Australia's mining industry, which has been an important source of economic wealth and growth. Mining will be even more critical in future years as the world shifts to a decarbonised energy system. Australia offers many key minerals such as copper, lithium, and rare earth metals that will be important in the construction of batteries and digitisation.

Australian mining companies pay royalties as a percentage of value of production to state governments that generally range from 4 or 5 per cent to 7.5 per cent for iron ore and over 8 per cent for coal. While these rates are often lower than those in China and India, they are well above effective mining tax levies in Canada and the United States.

Given Australia's higher effective company income taxes and stamp duties especially on real estate transfers, it is therefore not surprising Australia's mining companies typically pay more tax and mining levies on their gross profits compared to Canadian companies and, in the case of copper, gold and iron ore, the United States.

Leaving aside Brazil, China, India and Russia, Australia's fiscal system is less competitive than most countries for copper, gold and iron ore. With respect to lithium, Australia's tax system is currently competitive.

Given Australia's poor investment record, it should consider measures to encourage more private sector capital formation. Two types of reform are considered: company income tax rate reduction from 30 to 25 per cent (which would be close to OECD average rate) and machinery expensing available to all companies on a permanent basis.

The former is more neutral amongst asset choices and reduces the incentive to finance capital with debt. Expensing machinery distorts investment decisions by favouring machinery-intensive production but has a smaller cost in terms of lost revenues for the government. The rate reduction would have bigger impact in reducing average tax rates on manufacturing and service sectors but would lead to a loss of more revenues compared to machinery expensing.

Introduction

In our 2019 report on Australia's corporate tax system, we titled it *Australia watches the train go by*. At that time, the United States had already implemented its company tax reform that led to it broadening its tax base and dropping its federal company income tax rate to 21 per cent (including state tax rates, the average is 26.6 per cent – well below Australia's 30 per cent rate). Subsequently, other large countries have implemented similar rate-reduction-base-broadening reforms including France and India, both of which have dropped their company tax rates below that in Australia. Despite these changes, Australia has only reduced company income tax rates for smaller businesses.

As we show below, Australia has already missed the train. Investment, which is one of the key factors leading to per capita economic growth, has trailed poorly since 2015, one of the worst records among OECD countries.¹ While other trends, such as the 2014 precipitous decline in commodity prices, also affects investment performance, not all resource-based economies did poorly – investment in Norway and New Zealand rose by roughly 15 per cent over the same period. Australia's lack of company tax competitiveness is one factor that explains its relatively poor performance, which serves as an important barrier to economic growth.

Investment will be even more critical to Australia's economic prospects as the world climbs out of its two-year pandemic. Businesses are facing higher raw material, labour and capital costs due to inflation. To buttress the impact of cost inflation and maintain competitiveness in markets, more rapid investment in new technologies is needed in this decade including artificial intelligence and digitisation.

Further, with the global energy transformation, large scale investment will be needed to replace equipment and structures used for the generation, transmission and distribution of energy to households and businesses. Overall, investment demands will likely accelerate in the coming years.²

Below, we will show that Australia has the third highest company income tax rate of OECD countries in 2021, slightly below Portugal and Japan (and tied with Germany and Mexico) and well above the OECD GDP-weighted average of 26.3 per cent. Australia also has the third highest effective tax rate on marginal investments once accounting for differences in company tax write offs and other taxes on capital investment (such as stamp duties, real estate transfer taxes and capital levies). Australia's effective tax rate on marginal investments is 28.1 per cent, three points higher than the G20 GDP-weighted average of 25.1 per cent and almost four points higher than the OECD GDP-weighted average of 24.3 per cent.

We also focus on Australia's mining industry, which has been an important source of economic wealth and growth. Mining will be even more critical in future years as the world shifts to a decarbonised energy system. Australia offers many key minerals such as copper, lithium, and rare earth metals³ that will be important in the construction of batteries and digitisation.⁴ In our analysis below, we focus on coal and iron ore, given their current importance, as well as gold, copper and lithium.

Australian mining companies pay royalties as a percentage of value of production to state governments that generally range from 4 or 5 per cent to over 8 per cent (the latter in the case of coal). While these rates are often lower than those in China (where most mineral production is consumed domestically), they are well above effective mining tax levies in Canada (where provinces except Alberta levy mining profit taxes rather than revenue-based royalties) and the United States (where state governments have a combination of low revenue-based royalty rates and low profit-based mining levies).

Given Australia's poor investment record, measures to encourage more private sector capital formation need consideration. We consider two types of reforms: company income tax rate reduction from 30 to 25 per cent (which would be close to OECD average rate) and machinery expensing available to all companies on a permanent basis. The former is more neutral amongst asset choices and reduces the incentive to finance capital with debt. Expensing machinery distorts investment decisions by favouring machinery-intensive production and but has a smaller cost in terms of lost revenues for the government. Using a new methodology based on average rate of return to capital, which is higher than the marginal return to capital, we find that the rate reduction would have bigger impact in reducing average tax rates on manufacturing and service sectors but would lead to a loss of more revenues compared machinery expensing.

While governments are showing greater reluctance to reduce company taxes, the question remains whether Australia should finally address company tax reform to improve its competitive position for investment.

Will it jump on the train or not?

1 Australia's disappointing investment performance

Capital investment is a critical factor in determining economic growth. The well-known example of the corn economy illustrates this point. Farmers can consume their corn or plant it to grow more corn in the future. If the farmer consumes all the corn today, no corn will be available in the following years. Neither would they only seed corn since they need some corn to consume today, requiring the right balance between consumption and investment. Obviously, this characterisation of an investment model is simplistic, but it makes the point about that postponing consumption through investment provides resources to support future consumption.

Australia had one of the strongest investment performances about a decade ago but that is no longer the case. In 2013, household, company and government capital formation reached 27.9 per cent of GDP but has fallen to 23.2 per cent in 2019 and 22.5 per cent in the pandemic year 2020 (Graph 1). Australia's capital formation as a share of GDP was over 6 points better than the OECD average in the early part of this decade but it is now almost equivalent to the OECD average rate of capital formation.

Stripping out household investment (primarily residential real estate) and government capital formation (both of which are over half of Australia's investment in 2019 and 2020), the decline in company investment is even more breathtaking. A decade ago, Australia's had one of the best performing economies with respect to company gross capital formation topping at 17.2 per cent of GDP in 2012 (Graph 2). After 2012, it has been a steady downhill trend with company

investment falling to 11.1 per cent of GDP in 2019 and 10.5 per cent in the pandemic year 2020.

Despite declines in global commodity prices in 2014, other countries with significant resource sectors experienced rising, not falling investment except Canada and Australia.⁵ Despite the decline in commodity prices, Norway began the decade with company investment at 12.1 per cent of GDP, rising to 13.9 per cent of GDP by 2020. New Zealand had a similar experience with rising company investment as a share of GDP, overtaking Australia by 2015. In both cases, both resource-based economies had more company investment as a share of GDP than the OECD in 2019. US company investment has also risen by two points from 2010 to 2020, now better than Australia and slightly below the OECD average.

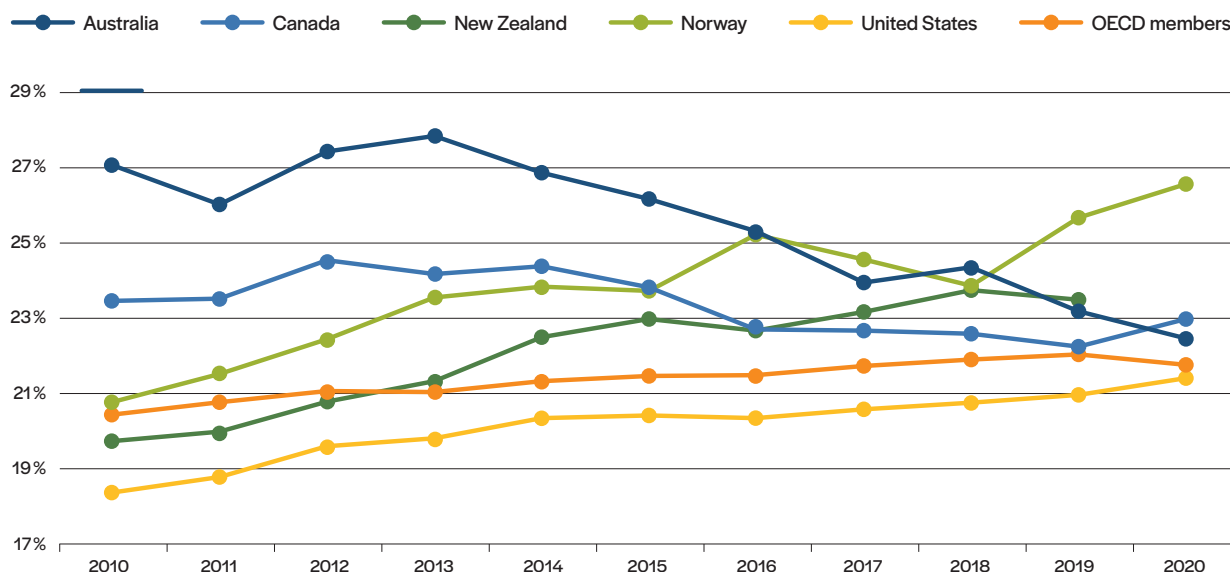
Much of the decline in Australian investment has been in the mining industry, which accounted for 27 per cent of private investment in 2019. Mining investment precipitously declined after 2015 by almost a half to \$33 billion in 2019 (annualised current prices).

Several industries had declining shares of GDP from 2015-2019. Investment grew by less than a third of the growth in nominal GDP for information, media and telecommunications, transport, postal and warehousing. Manufacturing investment grew by less than half the GDP growth rate. Private investment in construction grew about as quickly as GDP. Only the utilities sector experienced a sharp increase in private investment, partly related to the shift from coal-based energy to renewables.

GRAPH 1

Gross fixed capital formation (household, company and government)

Share of GDP

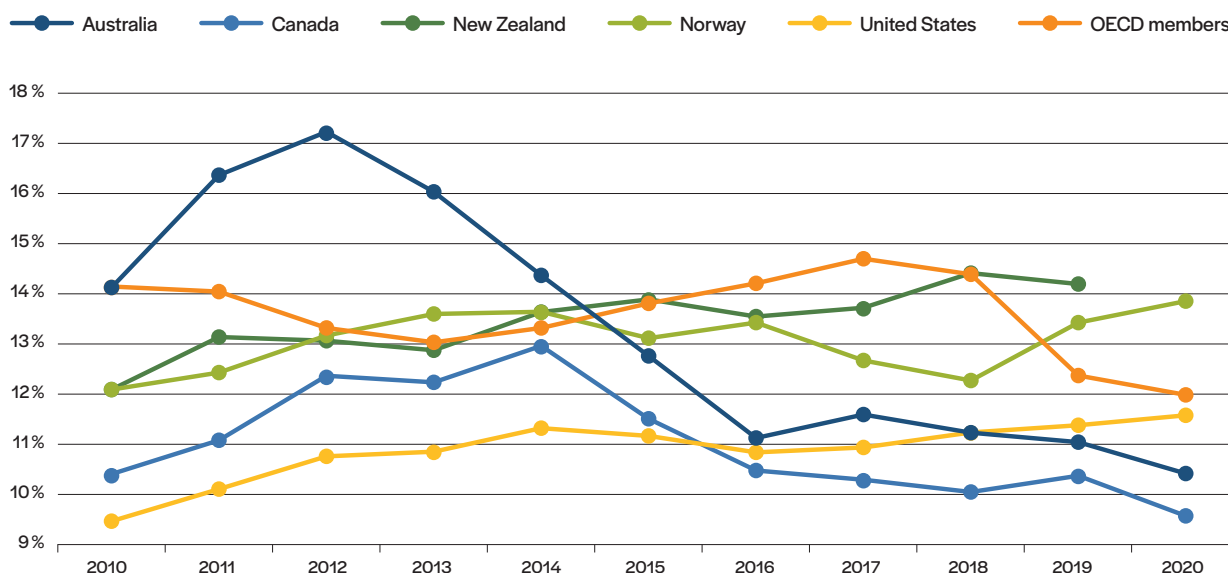


Source: World Bank Development Indicators

GRAPH 2

Company gross fixed capital formation

Share of GDP



Source: OECD, *National Accounts at a Glance*

Note: 'OECD members' grouping reflects average Corporate GFCF (% of GDP) over average total GFCF (% of GDP). Corporate average excludes Chile, Colombia, Costa Rica, Iceland, Israel, Mexico, and Turkey, due to lack of data.

While the decline in overall private investment is largely due to a reduction in fixed capital formation in the mining sector, the sub-par investment growth in significant industries like manufacturing, telecommunications and finance is also disappointing.

As the Productivity Commission noted in a 2020 report: "In the long term, if labour and capital are already being utilised, policy can only affect growth through enabling productivity gains."

Indeed, over a long horizon, almost all of Australia's growth in GDP per capita is attributable to labour productivity growth (the combination of capital-deepening and MFP [*multi-factor productivity*]).⁶ While the Productivity Commission focused on several important factors contributing to growth including improved regulatory policy, our focus is on company taxes as a barrier to per capita economic growth.

TABLE 1

Cumulative growth rate in private new capital expenditure by sector

2015-2019 (current prices)

Sector	Growth rate (%)
Construction	21.1
Electricity, gas, water and waste services	90.6
Financial and insurance services	7.1
Information, media and telecom	6.9
Manufacturing	10.5
Mining	-49.2
Transport, postal and warehousing	16.8
All other	18.1
Total private	-11.6
Australian GDP (current prices)	22.2

Source: Computations from data taken from the *Australian Bureau of Statistics: Private New Capital*. Annualised value was taken for 2019.

2 Statutory company income tax rates. How does Australia rank?

As in previous reports, we focus on two measures of tax competitiveness: the statutory company tax rate and the marginal effective tax rate on marginal investments. Here we first focus on the company income tax rate.

The statutory company tax rate is the headline rate that indicates how much profit a company might lose in company taxes paid to the government. It is a number easy to understand by management and employees but also quite relevant to several company decisions. The statutory tax rate not only affects the investment decision but also the choice between debt and equity financing (given the deductibility of interest from taxable corporate profits), international capital flows (such as dividend payments and fee payments from affiliates to the parent) and employee compensation (dividends versus salaries). In other words, the headline tax rate is a first step to understanding how company taxation impacts competitiveness and tax distortions affecting the allocation of capital.

In Graph 3, we compare Australia's company income tax rates with the GDP-weighted average of G7 and OECD countries since 2015. While Australia began with a 30 per cent tax rate that was less than the GDP-weighted OECD and G7 averages in 2015, the company tax rate eventually became non-competitive by 2018. In 2021, Australia's company income tax rate is above the OECD company tax rate of 26.3 per cent and the G7 rate of 27 per cent.

It is not a matter of Australia increasing its company tax rate that led to non-competitiveness. Instead, it is a result of so many countries reducing company tax rates

this past decade. The most dramatic change was US tax reform that resulted in the US federal company tax rate being reduced from 35 to 21 per cent beginning January 1, 2018. Given that the US is roughly a fifth of world GDP, it is not surprising the average OECD company tax rate dropped by 4 points from 2017 to 2018 (the G7 average tax rate fell 6 points from 2017 to 2018).

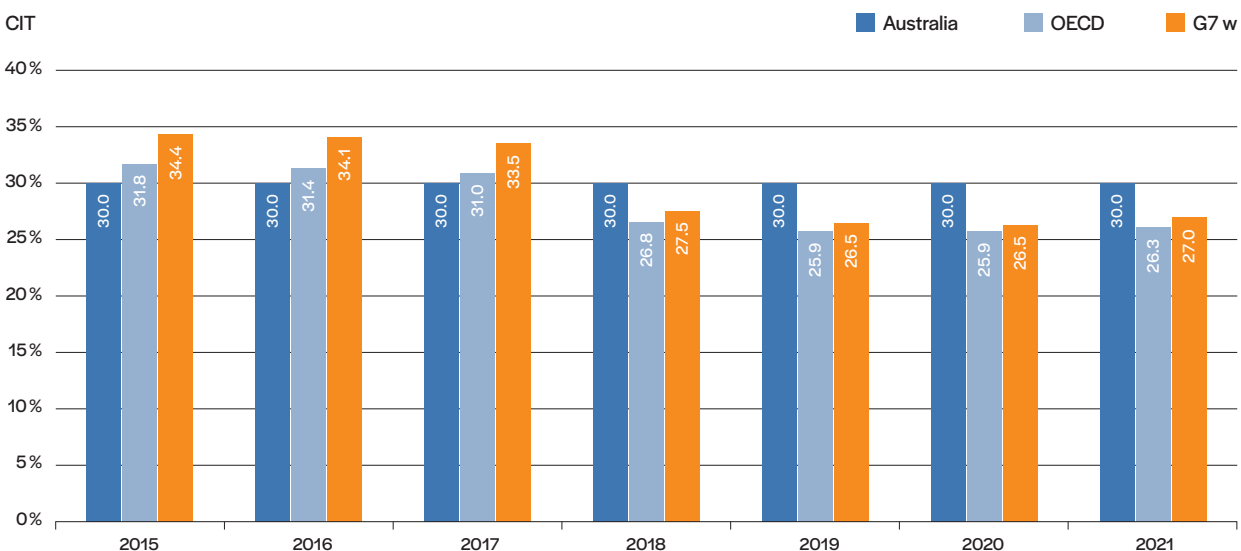
While the US had a sizeable impact on the OECD average, other countries also reduced company tax rates over time. In the past, we have calculated that the average OECD company tax rate fell by about 2 points from 33.2 per cent in 2010 to 31 per cent in 2017. Even after the dramatic US reform, some further reductions took place with the OECD company tax rate falling to 25.9 per cent by 2020 (a slight increase by a half point has occurred so far in 2021). Meanwhile, Australia remains stuck at 30 per cent during all these years.

To see how company income tax rates evolved by country, we provide a detailed comparison of company tax rates in 2021 compared with 2015 in Graph 4. Here we include not just the OECD countries but also the BRIC countries (Brazil, Russia, India and China) as well as five other countries with significant mining sectors (Colombia, Indonesia, Peru, South Africa and Zambia). Australia's company income tax rate is third highest of OECD countries (tied with Mexico and Germany) with Portugal (31.5 per cent) and Japan (30.6 per cent) with the highest statutory tax rates.

The largest reductions in company income tax rates since 2015 have been United States (13.4 points), Belgium (8.5 points), France (12.2 points), Greece (7 points), Norway

GRAPH 3

Australia company tax rates comparison to GDP-weighted G7 and OECD company tax rates 2015 to 2021



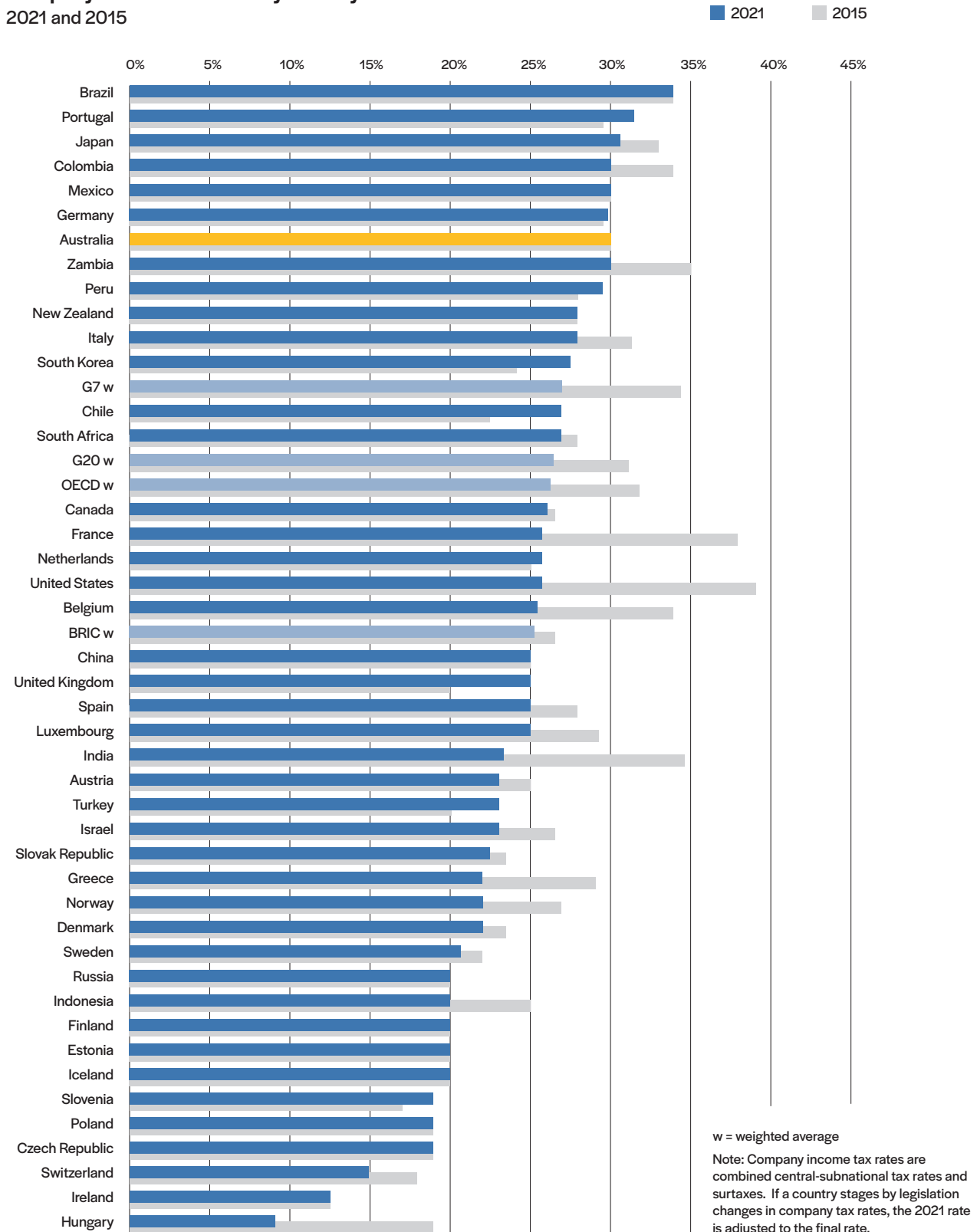
Note: Company income tax rates are combined central-subnational tax rates and surtaxes. If a country stages by legislation changes in company tax rates, the 2021 rate is adjusted to the final rate.

(5 points), India (11.3 points), Indonesia (5 points) and Zambia (5 points). Some countries have raised company income tax rates including Chile (by 4.5 points), Korea (3.3 points), Portugal (2 points), Slovenia (2 points) and Turkey (3 points). The United Kingdom has legislated an increase in its legislated company income tax rate at 19 per

cent currently (originally planned to be reduced to 17 per cent) to 25 per cent on profits in excess of 250,000 pounds as of April 1, 2023, which we include here as the tax rate for 2021. Overall, seven countries have raised their company income tax rates since 2015, 12 (including Australia) made no change and 24 reduced their rates.

GRAPH 4

Company income tax rates by country
2021 and 2015



3 Australia's declining overall tax competitiveness

While the headline company income tax rates are indicative of the amount of profit tax paid, other tax provisions play a role in determining the final amount. This includes the treatment of tax deductions for depreciation, inventory costs, interest expense and other costs as well as tax credits and allowances for investment. If governments provide tax incentives such as accelerated depreciation and/or investment tax credits, the tax paid as a share of profits will be below the headline company tax rate. Further, other taxes related to capital investment – sales taxes on capital purchases, asset-based taxes and real estate and financial transaction taxes – add to tax costs as well.

Nor should we forget about the importance of inflation, which is now 3 per cent in 2021 in Australia (and in some other countries even higher). With inflation, companies find it more expensive to replace capital and inventories, thereby increasing capital costs. On the other hand, inflation reduces the real cost of borrowed money, which helps offset rising replacement costs for capital. In some countries, including Chile and Mexico, profits are adjusted for inflation that typically results in lower taxable company income for companies with reasonable leverage ratios.

To assess how tax provisions affect the incentive to invest in capital, we estimate the marginal effective tax rate (METR) on capital for manufacturing and service companies operating in the 43 countries of this study (see Box A for an explanation of the methodology).⁷

For example, suppose companies must pay out in after-tax profits a real return (net of risk⁸ and taxes) equal to 5 per cent to attract financing from equity and bondholders for a new

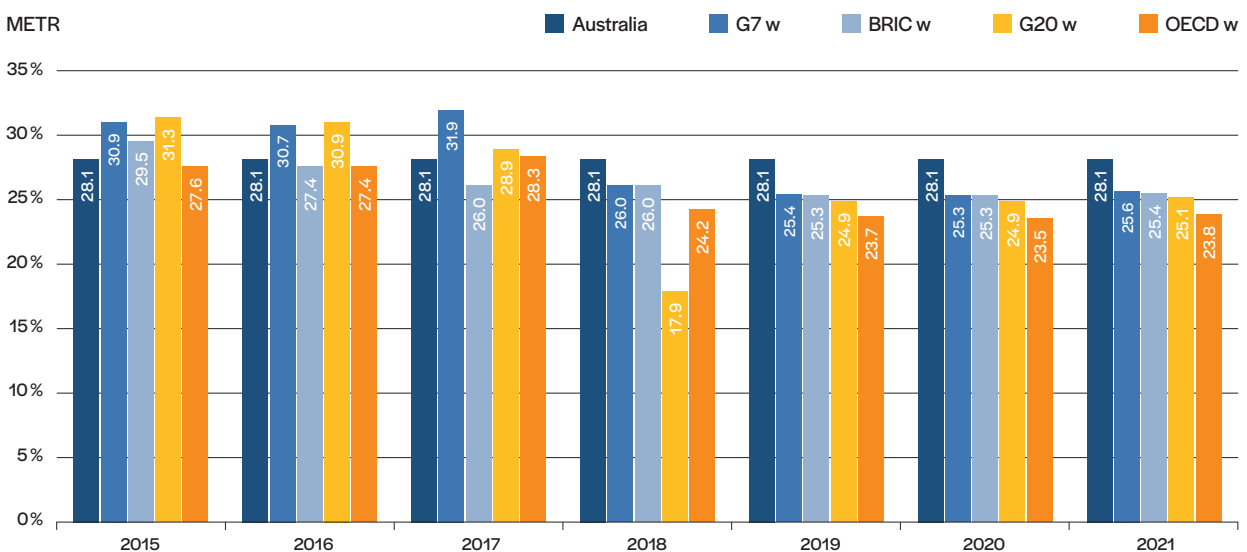
investment project. If the tax wedge is 50 per cent, it means that the company must earn a 10 per cent net-of-risk real rate of return on capital to cover taxes and cost of financing. If the project earns less than 10 per cent as a pre-tax rate of return, the project will not move forward. Of course, some projects might earn more than a 10 per cent rate of return on capital, but as long as the minimal rate of return is earned, a project will be profitable to undertake. Therefore, if the tax wedge decreases, more investment projects become profitable since a lower real rate of return is acceptable to cover both tax and financing costs.

Given that the estimates for the 43 countries include details related to tax parameters such as tax depreciation rates, inventory cost deduction and other taxes on capital, it is not surprising that the METR estimates will differ from headline company tax rates. However, within 95 countries the headline tax rates are important. In our study, we find that the correlation between the headline company tax rates and the METR is 46.9 per cent for the period 2018-2020. Thus, the ranking can be substantially affected but not entirely by the statutory company tax rates.

As shown in Graph 5, Australia's METR on capital is 28.1 per cent, no different than earlier years. The government has provided a reduction in company income tax rates for small businesses in recent years, but large company marginal investments are taxed at the highest rates. Temporary accelerated depreciation has also been given (to be phased out by 2023) but this has been focused on firms with less than \$5 billion in revenues, thereby excluding large multinational companies.

GRAPH 5

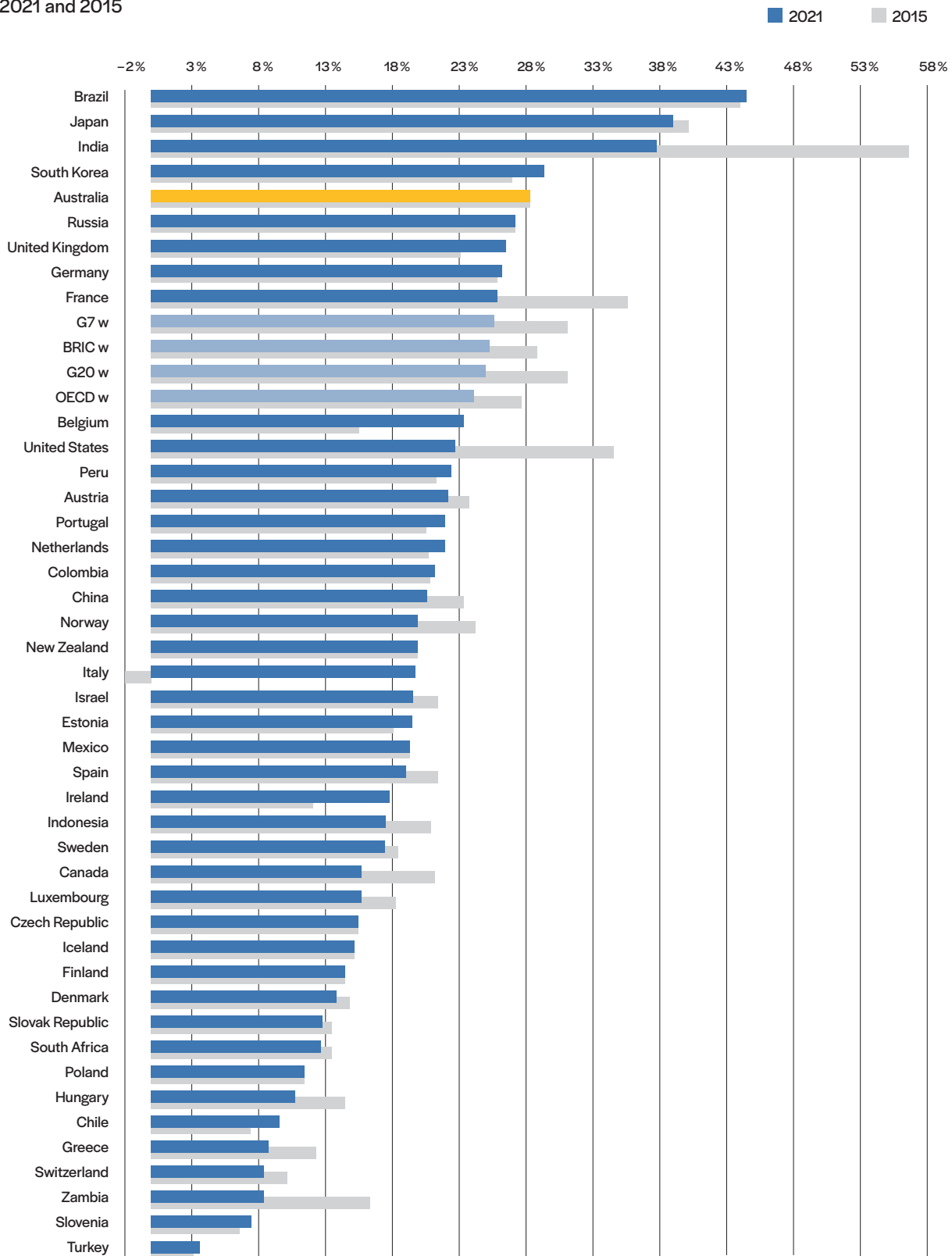
Marginal effective tax rates for Australia, OECD, BRIC, G7 and G20 groupings 2015 to 2021



Note: Author's calculations. W refers to GDP-weighted average.

GRAPH 6

Marginal effective tax rates by country
2021 and 2015



w = weighted average

Like the headline company tax rates, the METR for Australia was somewhat above the GDP-weighted average METR of 27.5 per cent for the OECD countries in 2015. In 2021, it is 4.8 points higher than the OECD average of 23.8 per cent.

While Australia's METR was below the G7, G20 and BRIC GDP-weighted averages in 2015, it is now higher than the other global economic groups. The major shifts reflect the reduction in METR in the United States and India in 2018 with VAT and company tax reforms. India's VAT reform led to a significant reduction in sales taxes on capital purchases by providing more input tax credits to companies purchasing goods and services from other companies (some non-refundable input taxes remain). Indian company tax reform substantially reduced company income tax rates but its impact was offset by a reduction in tax incentives.

As seen in Graph 6, Australia has the third highest METR among OECD countries, following Japan (38.8 per cent) and Korea (29.3 per cent). While India has sharply reduced its METR from 56.6 per cent in 2015 to 37.7 per cent today, it still remains higher than Australia's METR, primarily due to non-refundable VAT on capital purchases made by service companies. Brazil's METR is highest of all countries due to its high company income tax rate (34 per cent) and VAT on manufactured goods sold to other sectors in the economy.

Several other points are worth noting:

- Australian manufacturing bears an effective tax burden of 29.6 per cent that is 5th highest of all OECD countries.

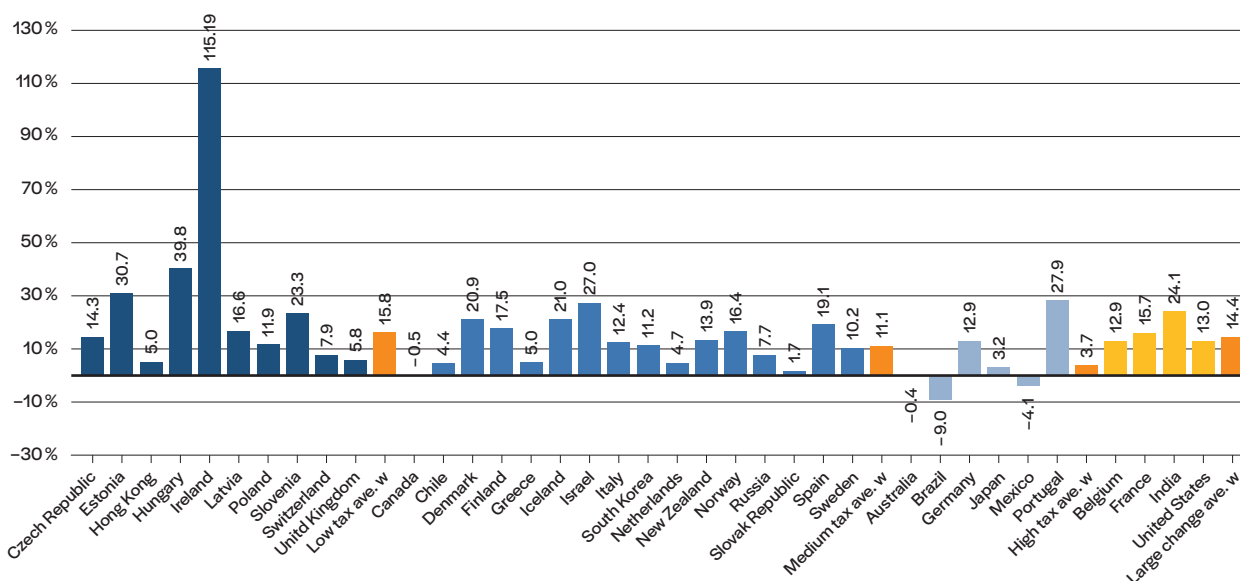
- The METR on Australian service industries (including construction, utilities, communications, transport and storage, trade and other services) is 28 per cent, second highest among OECD countries.
- Australia's company tax has been relatively neutral among manufacturing and service industries with tax write offs corresponding to economic costs. This encourages a more efficient allocation of capital by reducing inter-asset and inter-industry distortions. Important exceptions are tax concessions discussed above for (1) small businesses taxed at the rate of 25 per cent on profits for those firms with revenues less than \$50 million and (2) temporary expensing for investment in machinery for firms with revenues up to \$5 billion (to be eliminated in 2023 unless extended).

Do these METRs matter to investment? In this, we compare available data on gross fixed capital formation, or what might be more commonly referred to as investment in physical capital (including both private and public investment) by OECD country. Certainly, the commodity downturn affected the resource economies most (e.g. Australia including Canada, Brazil and Mexico) although some other resource economies like New Zealand and Norway had growing investment expenditures.

Countries are grouped according to whether a country is (1) high-taxed (company tax rates that are 30 per cent or above), (2) low-taxed (19 per cent or less) or (3) medium-taxed (company tax rates ranging from 20-29 per cent) and (4) those countries that experienced significant company

GRAPH 7

Percentage change in investment by country and METR (including GDP weighted average (Ave. w) 2015 to 2019



Source: National accounts data via OECD and World Bank.
Note: Ave. w represents the GDP-weighted average.

tax rate reductions by at least 5 points during the period 2016-19. Estonia and Latvia only tax distributed profits at 20 per cent (reinvested profits are exempt) so we treat these countries as low-taxed.

Gross fixed capital formation in Australia shrank -0.4 per cent during these four years, significantly below the medium-taxed country growth average (11.1 per cent). This contrasts to low-tax countries (15.8 per cent growth) with the highest being in Ireland (115.1 per cent). High-tax countries had paltry investment growth (3.7 per cent).

Those countries, which had sharp reductions in company income tax rates, all of which had high company income tax rates in 2016, had quite good investment growth (14.4 per cent). Of the OECD countries, Australia had the fourth worst growth in gross fixed capital formation since 2015, even worse than other economies with similar company income tax rates. Among the countries where investment is growing fastest, we see it is the low-tax countries like Ireland, Hungary and Estonia.

BOX A

An explanation of marginal effective tax rates

The impact of taxes on capital investment is based on an analytical measure of the marginal effective tax rate (METR). The METR is the annualised value of company taxes paid as a percentage of the pre-tax profitability of marginal investments.

Marginal investments are those that are incremental to the economy – they earn sufficient profit to attract financing from investor, covering risk and taxes. At the margin, businesses invest in capital until the rate of return on capital, net of taxes and risk, is equal to the cost of financing capital (or the “interest” rate). If the rate of return is more (less) than financing costs, firms will invest more (less) in capital. Thus, if a government increases the tax rate, it will result in businesses rejecting marginal projects that were profitable before taxes were increased.

Briefly, the METR or tax wedge, is the portion of capital-related taxes paid as a share of the pre-tax rate of return on capital for marginal investments (on the assumption that businesses invest in capital until the after-tax return on capital is equal to the cost of financing capital).

Taxes that impinge on capital investment include company income taxes (the rate and base), sales taxes on capital purchases (such as non-refundable sales taxes), asset-based taxes (capital taxes and property taxes), and transfer taxes on real estate and financial transactions.

In our analysis, we have included most taxes except municipal property taxes since the latter are difficult to measure due to variation in municipal rates and bases, unobservable by industry.

It is important to note that defining the tax paid as a share of the return to capital, not equity, results in debt sheltering investment from company income taxation. Companies relying more on leverage to finance capital will have a lower METR. We assume that 40 per cent of capital is financed by debt for all countries to focus on tax differences among countries rather than differences in leverage ratios.

In our analysis, we use similar capital structures to isolate tax differences among 94 countries (country-specific capital weights, if available, would give a different ranking). The capital structures, reflecting the distribution of assets among machinery, buildings, inventory and land investments, are based on Canadian data. Economic depreciation rates for assets are also based on Statistics Canada estimates.

Bond interest rates reflect differences in inflation rates across countries (following purchasing power parity assumption). Equity costs are based on a marginal supplier of finance equating the after-tax rates of return on stocks and bonds (the marginal investor is assumed to be a G7 investor holding an international portfolio of bonds and equity).

The analysis includes manufacturing and service industries (services include construction, utilities, transportation, communications, trade, and other business and household services).

4 Australia's mining tax burden

Mining is a critical industry for Australia not only as a source of wealth and employment but also public revenues. The federal government levies company income taxes on mining with special provisions for exploration and development expenditures unique to the non-renewable resource sector. State governments collect royalties as a share of the value of extracted ore except for the Northern Territory that has a profit-based mining levy. Other taxes directly affecting capital costs include federal stamp duties on real estate and financial transactions.

We compare mining taxation in Australia with other countries for five products: iron ore, gold, copper, lithium, and coal (thermal and metallurgical).⁹ Australia is the largest producer of iron ore in the world with a market share of 37 per cent of 2019 production. It is the second largest gold producer accounting for 9.9 per cent of global production, 6th largest copper producer with a market share of 4.5 per cent and the largest producer of lithium with a market share of 54.3 per cent. Australia is the 2nd largest producer of metallurgical (coking) coal (18.4 per cent market share), 6th largest producer of steam coal (4.6 per cent) and 6th largest producer of lignite (5.9 per cent).

The competing countries are those with significant production or reserves including Canada, Chile, China, Colombia, India, Indonesia, Mexico, Peru, Russia and South Africa. Each country has its own mining taxes that are levied in addition to company income and other taxes. We have already seen that the company income tax and stamp duties result in a tax disadvantage for Australian mining companies. The question here is whether mining companies also subject to state royalties are disadvantaged or not in competing for global mining investment.

The data appendix provides the various tax and economic parameters used to estimate marginal effective tax and royalty rates (METRR). We model a "time to build" process whereby exploration and development expenditures are incurred initially to prepare reserves. Once the reserves are ready, capital expenditures are incurred to be extracted and processed (bulk material).¹⁰

Based on recent data for the top 40 mining companies and other information from Natural Resource Canada and Fortescue financial statements, we estimate that exploration and development investment accounts for 17 and 46 per cent of capital expenditure respectively except for iron ore where exploration and development is 6 and 42 per cent of capital respectively. In many countries, exploration costs are expensed or encouraged by tax incentives before income is earned at the production stage. Development expenditures may also be written off prior earning income (in Australia, Brazil and Peru development costs are amortised over the life of the mine when production begins).

Given the importance of exploration and development expenditures, effective company income tax rates on marginal investments can be impacted substantially.

Another key metric that plays an important role in our assessment of the METRR is the gross profit margin (price

net of unit operating costs divided by price), which we have updated.¹¹ Since royalties fall on the value of production, its impact on profitability will depend on the price-cost margin – the smaller the difference between prices and costs, the greater the effective tax on the return to mining investments. Below, we provide a METRR analysis for each product. However, before doing so, we provide some brief observations as to how each country's mining tax regime differs from Australia in general terms since these points are common to all products.

Australia: Australian royalty rates on coal are 7 per cent and 7.5 per cent on iron ore. Copper and gold royalty rates are at 4 per cent (New South Wales) and 5 per cent (Queensland and Western Australia) although the gold royalty rate of 2.5 per cent is applied in Western Australia. As mentioned, Northern Territory has a profit-based mining levy that is applied at a rate of 20 per cent. Under the company income tax, exploration is expensed, and development is amortised over the life of mine except in Northern Territory where development costs are written off at rate of 25 per cent (declining balance). Production capital is written off rates varying between 8 and 47 per cent (equivalent declining balance), somewhat faster than some countries but lower than Canada's, for example.

Brazil: Brazil levies mining royalties on iron ore at a 2.5 per cent rate, well below Australia. However, as shown above, company income, VAT and other taxes result in Brazil having a high effective tax rate on capital.

Canada: Mining companies in Canada are subject to both company income and provincial mining profit taxes (except Alberta where only a 1 per cent mining royalty applies to coal). Canadian mining profit tax rates vary from 10 per cent in Ontario to 18 per cent in Saskatchewan) but companies can deduct exploration, development and production capital and other expenses except interest expense against their income. Further, the provinces provide either company income or mining profit incentives for exploration and processing, which results in quite low tax payments relative to other countries as seen below.

Chile: Like Canada, Chile has a profit-based mining royalty (14 per cent) that allows companies to recover their labour and capital costs in determining their amount owing. Except for the expensing of exploration and inflation adjustments, Chile provides few tax incentives.

China: China levies revenue-based royalties on mining at rates typically higher than those in Australia for copper and gold (and similar to coal). No incentives are provided for exploration and development that are amortised under the company income tax. China, however, have significant transfer and sales taxes on capital purchases although a lower company income tax rate than Australia.

Colombia: Similar to China, Colombia's revenue-based royalties on coal are relatively high (10 per cent) although lower than Australia with respect to iron ore (5 per cent). Unlike Australia, Colombia amortises exploration costs as well as development expenditures.

India: While India's METR on capital for industries is relatively high, it assesses no mining royalties. Exploration and development are amortised at much lower rate than most countries at a 10 per cent declining balance rate. Other taxes, especially its partly non-refundable VAT, can result in a high tax burden on mining investments as discussed above.

Indonesia: Indonesia levies royalty rates on a similar base as Australia. It has the most stringent deductions under the company income tax for exploration, development and production capital expenditures.

Mexico: While Mexico has the same company income tax rate as Australia, it is indexed for inflation with expensing provided for exploration costs and amortisation of development costs.

Peru: Peru levies a profit-based mining tax similar to the Northern Territory at a rate of 20.4 per cent. Under its company income tax, levied at 29.5 per cent (close to Australia), it allows companies to expense exploration costs and write off development costs at a 33 per cent rate (higher than the Northern Territory).

Russia: Russia levies mining royalties at rates (0.7 per cent thermal coal and 5.2 per cent) lower than Australia. Its royalty rates on copper (8 per cent) and gold (6 per cent) are higher than those of Australia. Its company income tax rate at 20 per cent is much lower than Australia's with exploration costs expensed and development costs amortised over the life of the mine. However, a 10 per cent investment tax credit is provided for depreciable capital expenditures.

South Africa: South Africa levies mining royalties at 7 per cent for coal and iron ore (somewhat less than Australia with respect to coal and to iron ore). Gold has a similar royalty rate to Australia but a special company income tax rate on gold mining, which varies according to profit/revenue margins. We estimate the current rate to be 25 per cent. Both exploration and development expenditures are expensed under the company income tax (only exploration is expensed in Australia).

United States: US states levy taxes that vary by product and state. Alaska, Arizona, Minnesota and Nevada, the focus for comparisons, levy profit-based mining taxes from 1.3 per cent (Arizona) to 7 per cent (Alaska). The states also levy royalties on production values at rates much lower than Australia (1.1 to 3 per cent) except for coal (8 (underground) to 12.5 per cent (surface) in Wyoming. Under the company income tax, exploration and development is amortised (although percentage depletion is often used in mineral extraction which provides a deduction up to 25 per cent of gross income).

Zambia: Zambia levies a royalty rate on the value of production similar to most Australian states. Its company income tax is levied at a rate of 30 per cent, the same as Australia, but it provides significant tax incentives for exploration and development.

These observations are quantified accordingly in the METRR estimates below for mining in Australia and other significant producers (Graphs 8 to 13). Overall, we come to the conclusion that Australia does not have a tax advantage to attract mining investment under the combined tax and royalty systems compared to Canada and United States for most products except coal in the United States. Australia is less competitive with respect to iron ore, gold and copper than most jurisdictions except Brazil, India, China (except iron ore) and Russia. Australia has a tax advantage for lithium investment except for Peru.

Specifically, we make the following observations.

- As shown in Graph 8, Australia's METRR on iron ore is 23 per cent, higher than all other countries except for Brazil and India. The 7.5 per cent royalty accounts for a third of the METRR while the company income tax accounts for the rest of the tax burden. India has a 15 per cent royalty and its company tax provides only a 10 per cent write-off for exploration and development costs. With remaining post-reform non-refundable VAT India is least tax competitive for iron ore investments. Brazil is less competitive for iron ore investments due to its company income and VAT levies which make up the bulk of the METRR. Quebec is the most tax competitive jurisdiction for iron ore investments due to substantial tax incentives under the company income tax, resulting a tax rate of 1.9 per cent on marginal investments.
- The Australian METRR for gold investment (Graph 9) ranges from 16.2 per cent in Western Australia (where the royalty is lowest) to 21.8 per cent for the Northern Territory. The company income tax accounts for about two-thirds of the METRR in Australia. Lower METRRs are in Canada and the United States for reasons given above. Mining effective tax and royalty rates are higher in China, Indonesia and Russia due to a higher royalty rates and slower rates of amortisation for exploration costs.
- Australia's METRR on marginal copper investments (Graph 10) ranges from 19.2 per cent in New South Wales to 20.4 per cent in Queensland, South Australia and Western Australia reflecting New South Wales royalty rate being one point less than the other states (4 versus 5 per cent). Overall, Australia mining is more heavily taxed than other countries especially Canada and the United States with the company income tax accounting for almost three-quarters of the effective tax rate. The METRRs are higher in China, Indonesia and Russia reflecting higher royalty rates in these three other countries compared to Australia and, in the cases of China and Indonesia, amortisation rather than expensing of exploration costs.
- The METRR on Australian lithium investments (Graph 11) is 17.1 per cent, similar to Chile (17.9 per cent) and somewhat above Peru (16.1 per cent). It is below the METRR in China, reflecting differences in royalty rates and the company income tax treatment of exploration costs.
- Coal mining is the highest taxed given the impact of relatively high royalties for those coal investments expected to earn a low future margin (Graph 12 and 13 provides separate estimates for metallurgical and thermal coal producers). The mining royalty accounts for roughly two-thirds of the effective tax rate. With the low profitability, the coal royalties, result in effective tax rates over 40 per cent. The Australian METRR is below China, Colombia, Indonesia, and the United States, where royalty rates are higher. Australia is less competitive for coal investments compared to Canada and Russia.

Recently, Queensland announced a new windfall royalty on coal production to raise more revenues given the recent substantial rise in coal prices. The existing royalty structure – which is modelled in Charts 12 and 13 – is a sliding scale with royalty rates of 7 per cent of revenues for prices up to \$100 a tonne, 12.5 per cent when prices vary between \$100 and \$150 a tonne and 15 per cent for prices above \$150 a tonne. The new royalty rates apply to higher price levels: 20 per cent when prices are between \$175 and \$225 a tonne, 30 per cent when prices are between \$225 and \$300 a tonne

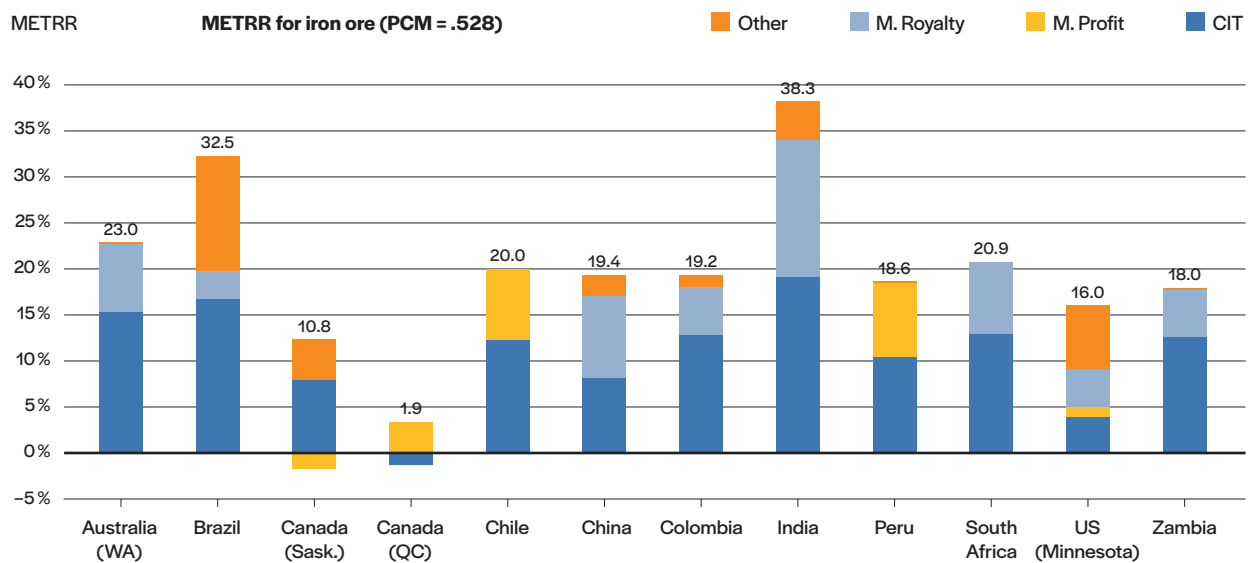
and 40 per cent when prices are above \$300 a tonne. At the end of June 2022, both thermal and coking coal prices have been above \$400 although they may trend down given a slowdown in the global economy.

While higher coal prices improve profit margins, they also lead to an increase in the royalty rate. The METRR will rise sharply with the new royalty rates. The METRR rises from 27.3 per cent when metallurgical coal prices are \$150 per tonne (15 per cent royalty rate) to 38 per cent when prices are above \$300 a tonne (40 per cent royalty rate).

With volatile prices, the METRR will become volatile during an economic cycle. As is well known, given price sensitive royalty rates, the average royalty rate over a cycle is higher when prices fluctuate. This would imply a higher METRR on marginal investments due to the risk embedded in fluctuating royalty rates. Given the significant changes in the Queensland royalty rates, a more detailed analysis is needed beyond the information provided here.

GRAPH 8

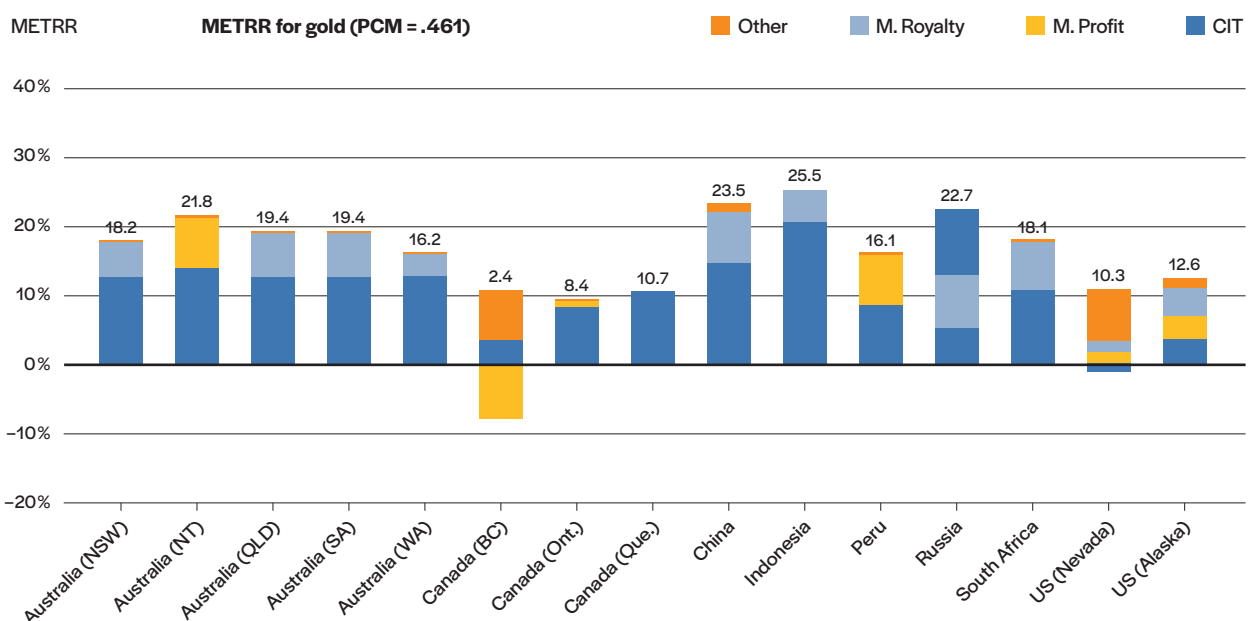
Marginal effective tax and royalty rates on iron ore investments
2021



Note: PCM refers to the price-cost margin. M. Royalty is the mining levy on value of production and M. Profit is the mining levy on profits. CIT is company income tax. Capital weights used for Iron Ore model differ from those used of other resources. See data appendix for more information.

GRAPH 9

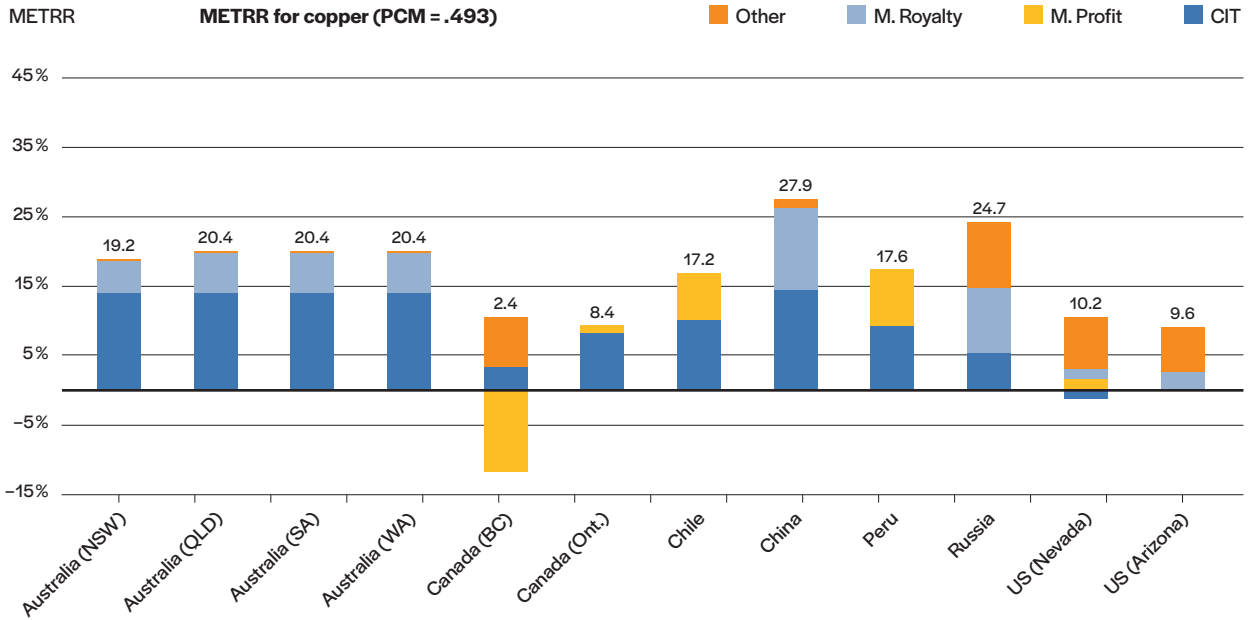
Marginal effective tax and royalty rates on gold investments
2021



Note: See graph 7

GRAPH 10

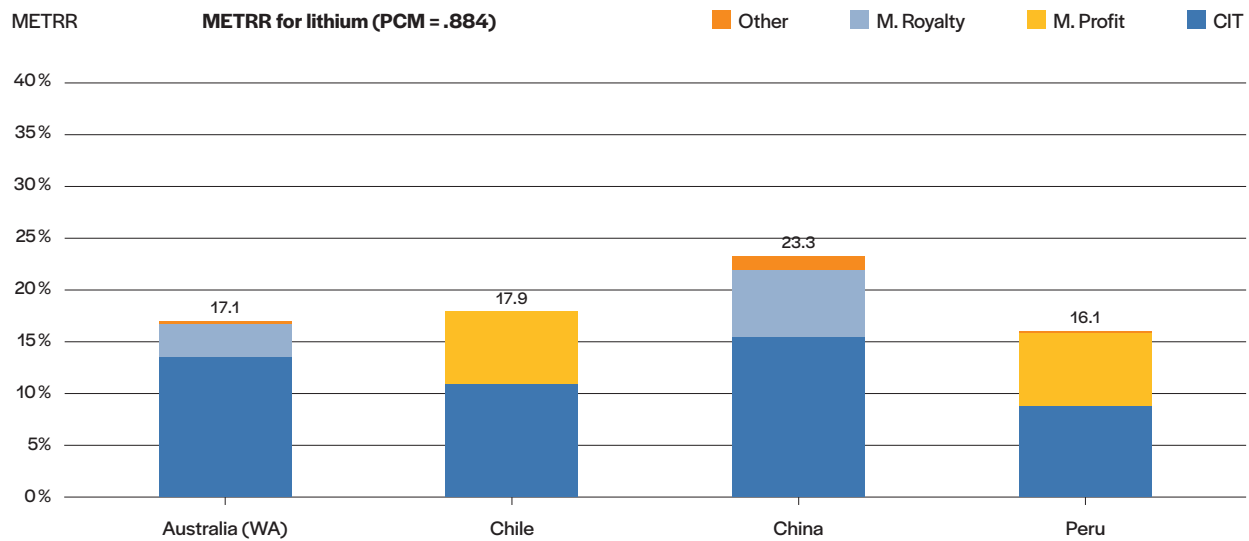
**Marginal effective tax and royalty rates on copper investments
2021**



Note: See graph 7

GRAPH 11

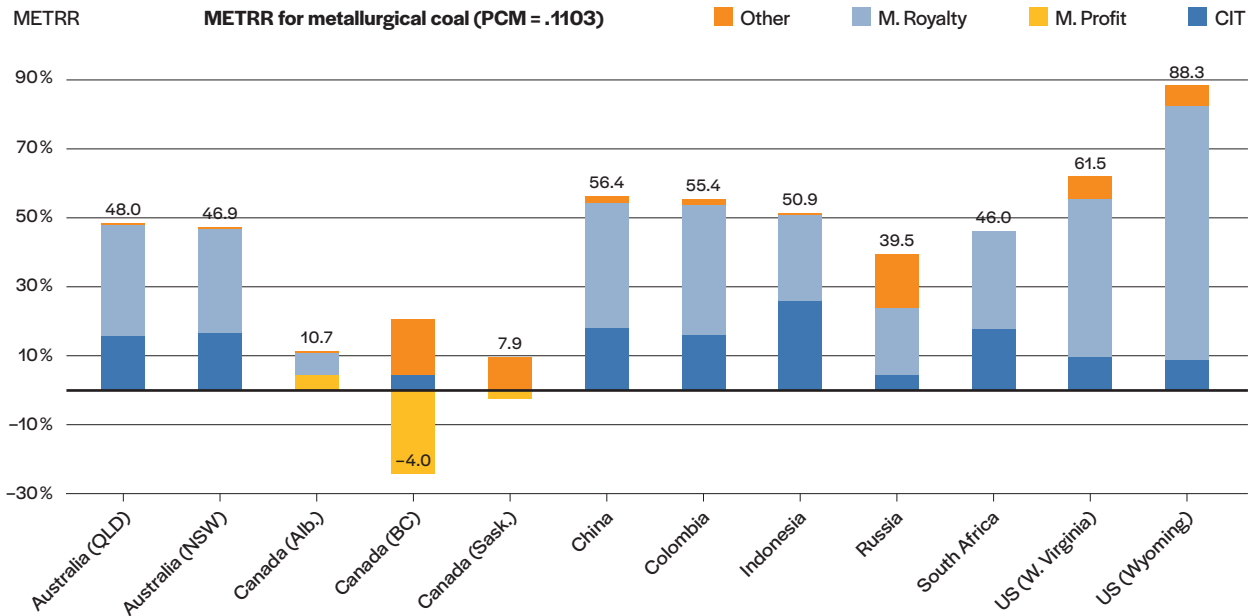
**Marginal effective tax and royalty rates on lithium investments
2021**



Note: See graph 7

GRAPH 12

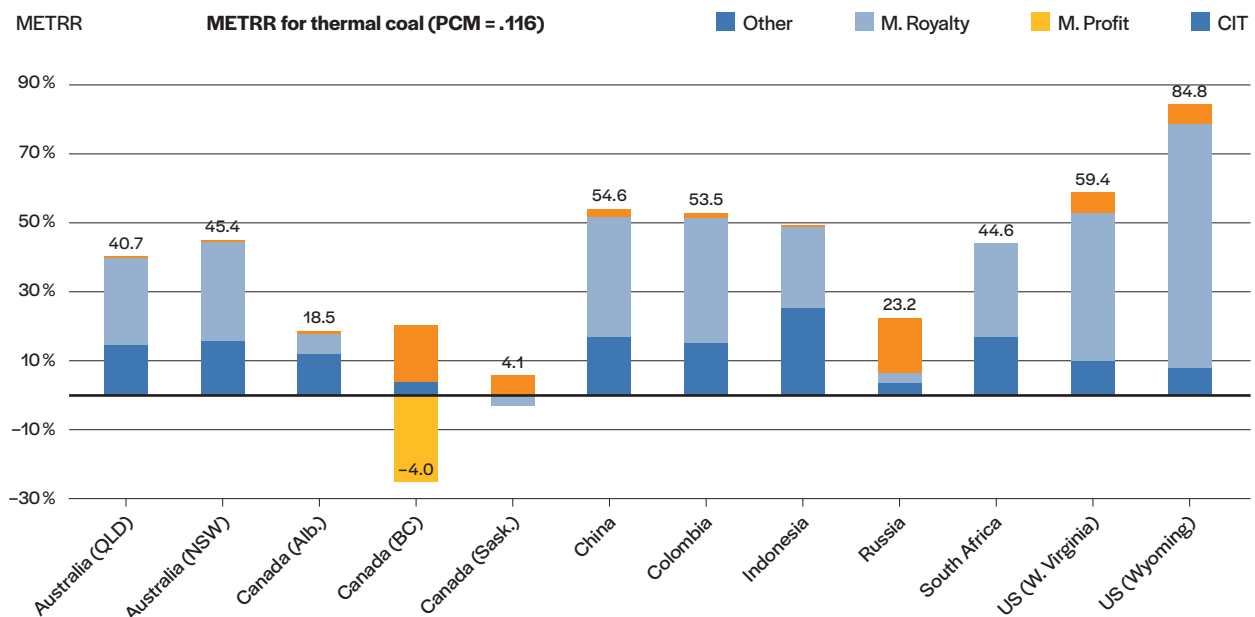
**Marginal effective tax and royalty rates on metallurgical coal investments
2021**



Note: See graph 7

GRAPH 13

**Marginal effective tax and royalty rates on thermal coal investments
2021**



Note: See graph 7

5 Can Australia be more tax competitive?

The overall conclusion reached so far is that Australia has one of the most uncompetitive company taxes in the world today. This was not true a decade ago, but it is now the case. The question is what Australia should do about it.

Many argue that companies are owned by the rich and powerful – the company income tax helps address inequality by taxing company profits. That argument, however, depends on the economic, not legal, incidence of the company and mining levies. Businesses do not pay tax. Instead, its stakeholders do. Those stakeholders include consumers who purchase goods and services, workers who receive labour compensation and capital owners including pension funds.

While some of the company tax falls on capital owners including economic rents derived from land and non-renewable resources, many studies have found that a majority of the tax results in higher consumer prices or lower wages (and less employment) for workers especially for open economies like Australia.¹² An Australian government analysis on the incidence of the company tax finds that two-thirds falls on workers through lower real wages and the rest on capital owners.¹³

Others have argued that Australia's unique dividend tax credit implies that the company tax has no impact on investment – the tax is fully offset by the dividend tax credit paid to Australian investors. While the dividend tax credit offsets the company tax impact on income paid as dividends to domestic owners, the company tax discourages foreign investment as well as capital formation funded by retained profits available to fund investment.

Some might argue that companies should pay more tax, especially multinationals that have the flexibility to avoid paying tax by shifting profits to other countries. Australia has several provisions to protect its current base, such as interest limitation and transfer pricing rules. The government is also supporting a 15 per cent global minimum tax on profits earned by Australian companies in foreign affiliates. The question, however, is whether domestic and foreign companies investing in Australia should bear more tax than what they would in other jurisdictions since effective tax rates are above 15 per cent in most countries.

Given Australia's poor investment record, its tax competitive position should be addressed. Australia has reduced company income taxes to a 25 per cent rate on small businesses with revenues less than \$50 million. While this benefits small firms by providing more cash flow for investments, it also creates distortions by encouraging companies to break up or remain small.¹⁴ Australia has also introduced temporary expensing for depreciable assets for those companies with less than \$5 billion in revenues to be phased out in 2023 (unless extended). Such provisions

encourage investment but with unintended consequences. For example, expensing or accelerated depreciation creates more demand for skilled relative to unskilled workers, worsening inequality while company rate reductions are more neutral in impact.¹⁵

To provide some guidance as to the impact of policy alternatives, two policies are examined below with respect to company tax reform. The first is to reduce the company income tax rate to 25 per cent, removing the distinction between small and large companies. The second is to introduce expensing for machinery capital for all companies without a time limitation.

The latter proposal comes with a lower revenue cost since benefits are provided for investment while company tax rate reductions apply to both new and old capital stock (many countries phase-in rate reductions to claw back some of the benefits to old capital). On the other hand, rate reductions are less distorting since it reduces taxes no matter the type of investment made by firms.

In Graph 14, we examine the impact of a 5-point reduction in the company income tax rate compared to machinery expensing on investment (the METR) and prospective amount of taxes collected (the average company income tax rate).

A company tax rate reduction of 5 points would reduce the METR from 28.1 per cent to 24.1 per cent, which would increase investment by about 5 per cent. This would result in Australia moving from having the third highest METR to sixth highest among OECD countries.

Machinery expensing would reduce the METR in Australia from 28.1 to 19.2 per cent, assuming companies remain in a taxpaying position rather than shift to a loss position. Expensing benefits companies that tend to be machinery intensive: their METR would fall 9.1 points from 28 per cent to 18.9 per cent. Manufacturing's METR declines by less with a drop of 6.3 points to 23.3 per cent.

While the company income tax rate reduction is more neutral in its impact, it would cost more revenue compared to expensing. The average tax rate would fall 4.7 points from 29.4 per cent to 24.7 per cent with the rate reduction. Machinery expensing would reduce the average tax rate by 2.5 points to 26.9 per cent. It also means that companies with large projects with average returns better than marginal investments, looking to invest globally, would find the rate reduction more appealing than expensing.

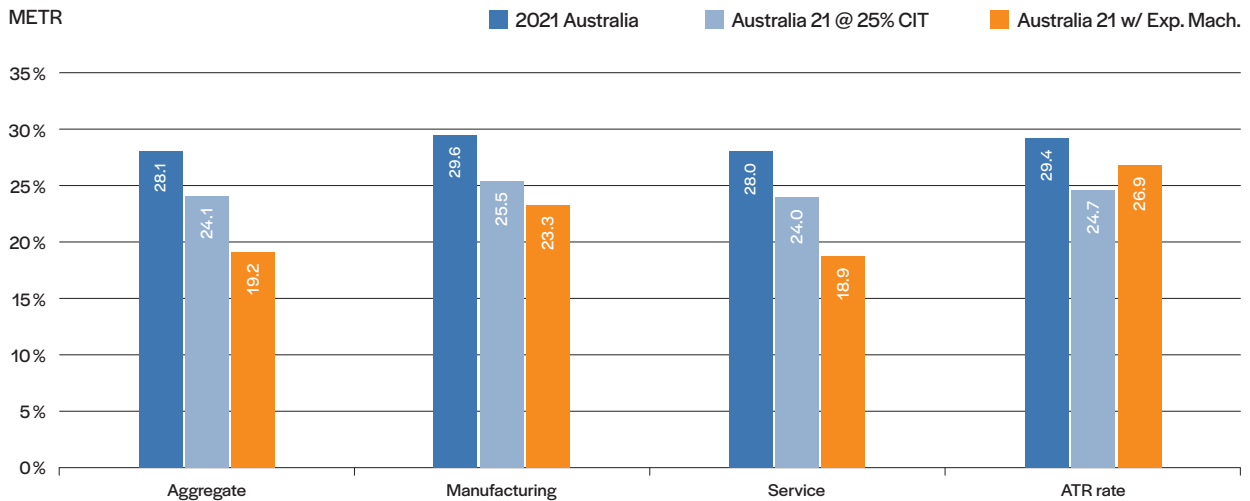
The loss in revenues with the rate reduction might be less than what is suggested by the average tax rate calculations. In our assessment we allow the tax base to increase with new capital investment. The rate reduction would reduce tax avoidance such as reducing the incentive for companies to

finance investment with debt. Further, expensing may not be as costly in revenue if it results in some companies becoming non-taxpaying. However, this latter point suggests that expensing may be less effective if the deduction provide little immediate tax relief.

These are two examples of policy choices available to spur investment. Others might include a reduction or elimination of stamp duties (that accounts for about three points of the METR). It could also include accelerated depreciation for both machinery and structures or an allowance to offset the impact of inflation on inventory costs. While we believe the rate reduction is the most straightforward and neutral approach to improve the investment climate, Australia should look at various options to improve its disappointing investment performance.

GRAPH 14

Marginal and average tax rates under rate reduction and expensing reforms



Note: The average tax rate is based on a 15 real pre-tax rate of return to capital derived from financial statistics.

Conclusion

Australia's investment performance has been poor since 2015, which will compromise long-term growth should it continue. Australia's disappointing company tax competitiveness in the past six years is one factor that explains its relatively poor investment performance. It still remains an important barrier to economic growth.

We have shown that Australia has the third highest company income tax rate of OECD countries in 2021, slightly below Portugal and Japan (and tied with Germany and Mexico) and well above the OECD GDP-weighted average of 26.3 per cent. It also has the third highest effective tax rate on marginal investments, once accounting for differences in company tax write offs and other taxes on capital investment (such as stamp duties and sales taxes on capital purchases). Its METR is at 28.1 per cent, which is three points higher than the G20 GDP-weighted average (25.1 per cent) and almost four points higher than the OECD weighted-average of 24.3 per cent.

We also focus on Australia's mining industry, which has been an important source of economic growth for Australia. Mining will be even more critical in future years as the world shifts to a decarbonised energy system. It offers minerals needed for battery technologies and digitisation such as lithium of which Australia currently is the largest producer in the world with over half the market. While mining royalties are not excessive compared to other countries, the non-competitive company tax structure makes Australian mining less competitive.

Data appendix

Marginal effective tax rates and company income tax rates

	Overall				Manufacturing				Service				Ranking competitiveness overall METR		Combined CIT rate	
	2021				2015				2021		2015		2021		2015	
	Overall	Manufacturing	Service	Difference	Overall	Manufacturing	Service	Difference								
Australia	28.1	29.6	28.0	1.6	28.1	29.6	28.0	1.6	39	38	30.0	30.0				
Austria	22.2	23.6	21.8	1.8	23.8	25.3	23.4	1.9	31	33	23.0	25.0				
Belgium	23.3	24.0	23.2	0.8	15.5	16.0	15.4	0.6	34	16	25.5	34.0				
Canada	15.7	9.4	17.7	8.3	21.1	15.7	22.9	7.2	16	27	26.1	26.6				
Chile	9.6	12.2	9.1	3.1	7.5	9.7	7.1	2.6	6	4	27.0	22.5				
Czech Republic	15.4	17.1	14.6	2.5	15.4	17.1	14.6	2.5	14	15	19.0	19.0				
Denmark	13.8	16.2	13.4	2.8	14.8	17.4	14.3	3.1	11	13	22.0	23.5				
Estonia	19.5	19.5	19.5	0.0	18.0	18.0	18.0	0.0	22	18	20.0	20.0				
Finland	14.4	17.1	13.8	3.3	14.4	17.1	13.8	3.3	12	11	20.0	20.0				
France	25.8	28.5	25.4	3.1	35.6	38.7	35.2	3.5	35	40	25.8	38.0				
Germany	26.1	29.7	25.0	4.7	25.9	29.4	24.7	4.7	36	35	30.0	29.7				
Greece	8.7	9.2	8.7	0.5	12.3	12.9	12.2	0.7	5	8	22.0	29.0				
Hungary	10.7	12.1	10.2	1.9	14.4	16.9	13.6	3.3	7	12	9.0	19.0				
Iceland	15.1	14.4	15.2	0.8	15.1	14.4	15.2	0.8	13	14	20.0	20.0				
Ireland	17.7	18.2	17.5	0.7	12.0	12.0	12.0	0.0	19	7	12.5	12.5				
Israel	19.5	21.0	19.3	1.7	21.4	22.9	21.1	1.8	23	30	23.0	26.5				
Italy	19.7	19.7	19.7	0.0	-2.0	-2.2	-2.0	0.2	24	1	27.9	31.4				
Japan	38.8	39.3	38.6	0.7	40.2	40.8	40.0	0.8	42	41	30.6	33.1				
Korea S.	29.3	32.1	28.0	4.1	26.9	29.5	25.8	3.7	40	36	27.5	24.2				
Luxembourg	15.6	19.4	15.4	4.0	18.2	22.3	18.0	4.3	15	19	24.9	29.2				
Mexico	19.3	21.8	18.7	3.1	19.3	21.8	18.7	3.1	21	21	30.0	30.0				
Netherlands	21.9	23.3	21.7	1.6	20.6	21.9	20.4	1.5	29	24	25.8	25.0				
New Zealand	19.8	19.9	19.8	0.1	19.8	19.9	19.8	0.1	25	22	28.0	28.0				
Norway	20.0	21.1	19.9	1.2	24.3	25.5	24.1	1.4	26	34	22.0	27.0				
Poland	11.5	12.0	11.3	0.7	11.5	12.0	11.3	0.7	8	6	19.0	19.0				
Portugal	22.1	21.3	22.2	0.9	20.5	19.8	20.6	0.8	30	23	31.5	29.5				
Slovak Republic	12.7	15.7	11.9	3.8	13.4	16.5	12.5	4.0	10	10	22.5	23.5				
Slovenia	7.4	8.5	7.1	1.4	6.5	7.5	6.2	1.3	2	3	19.0	17.0				
Spain	19.0	19.9	18.9	1.0	21.4	22.3	21.2	1.1	20	29	25.0	28.0				
Sweden	17.4	18.4	17.2	1.2	18.4	19.4	18.2	1.2	17	20	20.6	22.0				
Switzerland	8.4	8.6	8.3	0.3	10.1	10.4	10.1	0.3	4	5	14.9	17.9				
Turkey	3.6	6.2	2.9	3.3	3.0	5.0	2.5	2.5	1	2	23.0	20.0				
United Kingdom	26.5	30.0	26.0	4.0	23.1	23.7	23.1	0.6	37	31	25.0	20.0				
United States	22.6	23.6	22.4	1.2	34.6	32.1	36.0	3.9	33	39	25.7	39.1				
Brazil	44.7	33.3	46.5	13.2	43.9	28.0	46.5	18.5	43	42	34.0	34.0				
China	20.6	24.3	18.7	5.6	23.4	27.2	21.5	5.7	27	32	25.0	25.0				
India	37.7	30.4	39.7	9.3	56.6	42.6	60.5	17.9	41	43	23.3	34.6				
Russia	27.2	30.7	26.5	4.2	27.2	30.7	26.5	4.2	38	37	20.0	20.0				
Colombia	21.1	24.9	20.3	4.6	20.9	25.9	20.0	5.9	28	26	30.0	34.0				
Indonesia	17.4	21.0	16.1	4.9	20.9	25.0	19.3	5.7	18	25	20.0	25.0				
Peru	22.3	22.7	22.3	0.4	21.3	21.6	21.2	0.4	32	28	29.5	28.0				
South Africa	12.7	16.5	12.0	4.5	13.3	17.3	12.6	4.7	9	9	27.0	28.0				
Zambia	8.4	17.8	7.3	10.5	16.3	26.6	15.2	11.4	3	17	30.0	35.0				
G7 w	25.6				30.9	30.3	31.5	1.2			27.0	34.4				
BRIC w	25.4				29.5	29.3	28.7	0.6			25.3	26.6				
G20 w	25.1				31.3	31.7	31.2	0.5			26.4	31.1				
OECD w	23.8				27.6	27.5	27.9	0.4			26.3	31.8				

Data used for METR estimates

	Inflation (%)	Tax depreciation range (%)	Inventory accounting	Asset (%)	Capital input sale (%)	Capital transfer (%)	Financial transfer (%)
	2021	2021		Applicable taxes			
Australia	1.7	2.6 – 23.9	Optional			5.6	
Austria	1.5	3.1 – 10.6	Optional			4.6	
Belgium	1.6	7.0 – 32.9	LIFO				100.0
Canada	2.0	4.0 – 55.0	FIFO	0.8	0.5		
Chile	3.1	7.5 – 39.7	LIFO				100.0
Czech Republic	1.7	3.1 – 20.8	Optional			4.0	
Denmark	0.7	5.1 – 22.7	FIFO			0.6	
Estonia	1.3	9.9 – 21.6	LIFO				
Finland	0.6	8.2 – 28.7	FIFO			4.0	100.0
France	0.8	3.1 – 26.5	Optional			5.1	100.0
Germany	1.1	3.1 – 14.4	LIFO			5.1	
Greece	-0.1	5.3 – 39.2	LIFO				100.0
Hungary	1.8	3.3 – 48.1	Optional				
Iceland	2.2	3.3 – 30.5	FIFO			1.6	
Ireland	0.3	2.0 – 12.4	FIFO			7.5	100.0
Israel	0.1	4.2 – 29.8	Optional			10.0	
Italy	0.6	2.4 – 15.0	LIFO				100.0
Japan	0.5	2.0 – 21.3	Optional	1.4			
Korea S.	1.1	2.6 – 20.1	LIFO			3.5	100.0
Luxembourg	1.2	4.1 – 21.0	Optional			7.0	
Mexico	4.0	5.1 – 15.4	LIFO			3.5	
Netherlands	1.3	2.9 – 20.9	Optional			7.0	
New Zealand	1.2	6.8 – 23.9	Optional				
Norway	2.5	3.6 – 24.5	FIFO			2.5	
Poland	0.9	2.6 – 25.8	LIFO				100.0
Portugal	0.8	2.2 – 19.8	Optional			0.8	100.0
Slovak Republic	1.1	5.0 – 17.3	Optional				
Slovenia	0.8	3.5 – 21.6	Optional				
Spain	0.7	2.1 – 29.2	Optional			1.1	
Sweden	1.3	3.2 – 19.5	FIFO			4.3	
Switzerland	0.1	5.7 – 31.9	LIFO				100.0
Turkey	11.7	12.5 – 48.8	Optional				100.0
United Kingdom	1.5	3.0 – 17.7	FIFO			5.0	100.0
United States	2.0	4.0 – 55.0	Optional	0.3	3.3	0.4	
Brazil	5.8	4.1 – 11.7	Optional		12.5	4.0	100.0
China	2.0	7.0 – 14.6	Optional		1.0	4.0	
India	5.3	5.1 – 35.0	Optional			6.0	100.0
Russia	6.8	3.1 – 20.8	Optional	1.3			
Colombia	4.7	5.0 – 19.4	LIFO				100.0
Indonesia	4.0	5.1 – 14.0	Optional			5.3	
Peru	2.7	4.6 – 20.0	Optional			3.0	
South Africa	4.9	5.0 – 25.0	Optional				100.0
Zambia	10.3	5.1 – 47.3	Optional			5.0	100.0

Mining data used for METRR

Data appendix notes:

1. Similar in structure to the corporate franchise tax
2. Assumes 19 per cent profit to revenue ratio for gold producers.

For more info see <https://www.sars.gov.za/wp-content/uploads/Ops/Guides/LAPD-Gen-G02-Guide-for-Tax-Rates-Duties-Levies.pdf>

1. Where sale in various forms or stages of processing face different royalty rates we take the rate for 'Concentrate' for all resource categories other than Iron ore. For Iron Ore the royalty rate for raw ore ('crushed and screened') is taken.
2. Capital asset tax is not a minimum tax
3. Declining balance unless denoted by a star
4. Where additional mining tax depreciation rates are not explicitly given, rates shown are also applied for depreciation under the mining profit tax for jurisdictions with a profit tax
5. Capital weights derived from Canadian Natural Resources capital spending data for 2017-2019, along with data from PWC's *Mine 2021 Great expectations, seizing tomorrow*
6. Capital weights derived from Canadian Natural Resources capital spending data for 2017-2019, along with data from PWC's *Mine 2021 Great expectations, seizing tomorrow*, and exploration spending data from Fortescue's 'Capital expenditure' overview. The capital weights for exploration here substitute Fortescue's average exploration expenditure between 2017-2021 for the Natural Resources Canada data used for the remaining resources. The non-exploration capital categories are weighted up to 100 per cent in their existing relative proportions.

Capital weights

	Non-iron ore (5) (%)	Iron ore
Depreciable assets	25	28
Inventory	12	13.36
Land	0.16	0.2
Exploration	17	6
Development	46	42
Aggregate-including E&D	100	100

Price cost margin by resource

Resource	Price cost margin (%)
Copper	49.3
Coal (metallurgical)	11.0
Coal (thermal)	11.6
Gold	46.1
Iron ore	52.8
Lithium (Carb.)	88.4

Average life of mine by resource

Resource	Years
Coal (metallurgical)	16.0
Coal (thermal)	15.0
Copper	17.5
Gold	16.5
Iron ore	18.5
Lithium	18.5
Cross mine average	20.5

	Australia					Brazil
	NSW	NT	QLD	SA	WA	
Company Income Tax Rate	30.0%	30.0%	30.0%	30.0%	30.0%	34.0%
Revenue-Based Royalty⁽¹⁾						
Coal Metallurgical	8.2%		8.6%			
Coal Thermal	8.2%		7.0%			
Copper	4.0%		5.0%	5.0%	5.0%	
Gold	4.0%		5.0%	5.0%	2.5%	
Iron Ore					7.5%	3.5%
Lithium					5.0%	
Profit-Based Royalty						
						20.0%
Additional Taxes						
Effective Sales Tax On Capital Purchases						8%
Real Estate Transfer Tax	7%	5.95%	5.75%	7%	7%	4%
Capital Asset Tax ⁽²⁾						
Gross Receipts Tax						2.48%
Financial Transaction Tax(s)						1.50%
Additional Features						
Inflation adjustment						INE/JCP
						Non-VAT
						Manu. Tax
						*
Company Income Tax Depreciation⁽³⁾						
Depreciable Capital - Min	8%	8%	8%	8%	8%	4%
Depreciable Capital - Max	47%	40%	47%	47%	47%	20%
Exploration ⁽⁴⁾	100%	100%	100%	100%	100%	4%
Development ⁽⁴⁾	6%	25%	6%	6%	6%	5%
Mining Tax						
Exploration		50%				
Development		50%				
Depreciable Capital		100%				
Depreciable Capital - Processing						
Minimum Tax		Yes				
Non-Tax Parameters						
Inflation	1.5%	1.5%	1.5%	1.5%	1.5%	7.2%
Real interest rate	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%
Nominal Interest Rate	5.3%	5.3%	5.3%	5.3%	5.3%	11.0%
Debt-to-Asset ratio	40%	40%	40%	40%	40%	40%
Cost of Equity	4.9%	4.9%	4.9%	4.9%	4.9%	10.2%
Nominal Financing Cost	4.4%	4.4%	4.4%	4.4%	4.4%	8.5%
Real Financing Cost	2.9%	2.9%	2.9%	2.9%	2.9%	1.4%
Time to Payout - Exploration	8	8	8	8	8	8
Time to Payout - Development	4	4	4	4	4	4

	Canada					Chile
	Alberta	BC	Ontario	Quebec	Sask.	
Company Income Tax Rate	23.0%	27.0%	25.0%	26.5%	27.0%	27.0%
Revenue-Based Royalty⁽¹⁾						
Coal Metallurgical	1.0%					
Coal Thermal	1.0%					
Copper						
Gold						
Iron Ore						
Lithium						
Profit-Based Royalty	13.0%	13.0%	10.0%	16.0%	10% /18%(c)	14.0%
Additional Taxes						
Effective Sales Tax On Capital Purchases		7%			6%	
Real Estate Transfer Tax	0.20%	3%	2%	1.50%	0.30%	
Capital Asset Tax ⁽²⁾						
Gross Receipts Tax						
Financial Transaction Tax(s)						
Additional Features						
Inflation adjustment						Yes
		33% super- deduction			Corporation capital tax	
Company Income Tax Depreciation⁽³⁾						*
Depreciable Capital - Min	5%	5%	5%	5%	5%	2%
Depreciable Capital - Max	100%	100%	100%	100%	100%	33%
Exploration ⁽⁴⁾	100%	100%	100%	100%	100%	100%
Development ⁽⁴⁾	30%	30%	30%	30%	30%	5%
Mining Tax						
Exploration		100%	100%	100%	150%	
Development		100%	100%	150%	150%	
Depreciable Capital		133%	100%	30%	100%	
Depreciable Capital - Processing		133%	15%	30%	100%	
Minimum Tax		Yes				
Non-Tax Parameters						
Inflation	2.0%	2.0%	2.0%	2.0%	2.0%	3.1%
Real interest rate	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%
Nominal Interest Rate	5.8%	5.8%	5.8%	5.8%	5.8%	6.9%
Debt-to-Asset ratio	40%	40%	40%	40%	40%	40%
Cost of Equity	5.4%	5.4%	5.4%	5.4%	5.4%	3.5%
Nominal Financing Cost	4.9%	4.9%	5.0%	4.9%	4.9%	6.3%
Real Financing Cost	2.9%	2.9%	3.0%	2.9%	2.9%	3.2%
Time to Payout - Exploration	8	8	8	8	8	8
Time to Payout - Development	4	4	4	4	4	4

	China	Colombia	India	Indonesia	Mexico	Peru
Company Income Tax Rate	25.0%	30.0%	25.1%	27.5%	30.0%	29.5%
Revenue-Based Royalty⁽¹⁾						
Coal Metallurgical	10.0%	10.0%		7.0%		
Coal Thermal	10.0%	10.0%		7.0%		
Copper	10.0%					
Gold	6.0%			3.75%		
Iron Ore	9.0%	5.0%	15.0%			
Lithium	10.0%					
Profit-Based Royalty					7.5%	20.4%
Additional Taxes						
Effective Sales Tax On Capital Purchases	1.0%		4.0%			
Real Estate Transfer Tax	4.0%	7.93%	7.0%			3.0%
Capital Asset Tax ⁽²⁾						
Gross Receipts Tax		0.75%				
Financial Transaction Tax(s)		0.40%	0.20%			
Additional Features						
Inflation adjustment					Yes	
Company Income Tax Depreciation⁽³⁾						
	*	*				*
Depreciable Capital - Min	5%	5%	8%	10%	7.5%	5%
Depreciable Capital - Max	33%	25%	40%	13%	40.3%	20%
Exploration ⁽⁴⁾	6%	20%	10%	6%	100%	100%
Development ⁽⁴⁾	6%	20%	10%	6%	4.9%	33%
Mining Tax						
Exploration						
Development						
Depreciable Capital						
Depreciable Capital - Processing						
Minimum Tax						
Non-Tax Parameters						
Inflation	2.0%	4.7%	5.3%	4.0%	4.0%	2.7%
Real interest rate	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%
Nominal Interest Rate	5.8%	8.5%	9.1%	7.8%	7.8%	6.5%
Debt-to-Asset ratio	40%	40%	40%	40%	40%	40%
Cost of Equity	5.4%	7.9%	8.5%	7.2%	3.5%	6.0%
Nominal Financing Cost	5.0%	7.1%	8.3%	6.6%	7.2%	5.4%
Real Financing Cost	3.0%	2.4%	2.9%	2.6%	3.2%	2.8%
Time to Payout - Exploration	8	8	8	8	8	8
Time to Payout - Development	4	4	4	4	4	4

			United States			
	Russia	South Africa	Alaska	Arizona	Minnesota	Nevada
Company Income Tax Rate	20.0%	25% / 27% (b)	28.4%	24.9%	22.9%	21.0%
Revenue-Based Royalty⁽¹⁾						
Coal Metallurgical	5.2%	7.0%				
Coal Thermal	0.7%	7.0%				
Copper	8.0%			2.0%		1.1%
Gold	6.0%	5.0%	3.0%			1.1%
Iron Ore		7.0%			3.7%	
Lithium						
Profit-Based Royalty						
Additional Taxes						
Effective Sales Tax On Capital Purchases		0.2%	1.7%	7.7%	7.3%	7.8%
Real Estate Transfer Tax					0.5%	0.3%
Capital Asset Tax ⁽²⁾	1.32%					
Gross Receipts Tax						0.90%
Financial Transaction Tax(s)						
Additional Features						
Inflation adjustment					Yes	
		Special CIT for Gold ^(b)			Occupation Tax ^(a)	
Company Income Tax Depreciation⁽³⁾	*	*				
Depreciable Capital - Min	20%	10%	4%	4%	4%	4%
Depreciable Capital - Max	67%	20%	45%	45%	45%	45%
Exploration ⁽⁴⁾	100%	100%	70%	70%	70%	70%
Development ⁽⁴⁾	6%	100%	70%	70%	70%	70%
Mining Tax						
Exploration						
Development						
Depreciable Capital						
Depreciable Capital - Processing						
Minimum Tax						
Non-Tax Parameters						
Inflation	6.8%	4.9%	2.0%	2.0%	2.0%	2.0%
Real interest rate	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%
Nominal Interest Rate	10.6%	8.7%	5.8%	5.8%	5.8%	5.8%
Debt-to-Asset ratio	40%	40%	40%	40%	40%	40%
Cost of Equity	9.9%	8.1%	5.4%	5.4%	5.4%	5.4%
Nominal Financing Cost	9.3%	7.5%	4.9%	5.0%	5.0%	5.1%
Real Financing Cost	2.5%	2.5%	2.9%	3.0%	3.0%	3.1%
Time to Payout - Exploration	8	8	8	8	8	8
Time to Payout - Development	4	4	4	4	4	4

	United States		
	Virginia	Wyoming	Zambia
Company Income Tax Rate	25.7%	21.0%	30%
Revenue-Based Royalty⁽¹⁾			
Coal Metallurgical	11.5%	18.6%	
Coal Thermal	11.5%	18.6%	
Copper			
Gold			
Iron Ore			5.0%
Lithium			
Profit-Based Royalty			
Additional Taxes			
Effective Sales Tax On Capital Purchases	6.1%	5.4%	
Real Estate Transfer Tax	5.4%	5.4%	5.0%
Capital Asset Tax ⁽²⁾			
Gross Receipts Tax			
Financial Transaction Tax(s)			
Additional Features			
Inflation adjustment			
Company Income Tax Depreciation⁽³⁾			
Depreciable Capital - Min	4%	4%	5%
Depreciable Capital - Max	45%	45%	25%
Exploration ⁽⁴⁾	70%	70%	100%
Development ⁽⁴⁾	70%	70%	25%
Mining Tax			
Exploration			
Development			
Depreciable Capital			
Depreciable Capital - Processing			
Minimum Tax			
Non-Tax Parameters			
Inflation	2.0%	2.0%	10.3%
Real interest rate	3.8%	3.8%	3.8%
Nominal Interest Rate	5.8%	5.8%	14.1%
Debt-to-Asset ratio	40%	40%	40%
Cost of Equity	5.4%	5.4%	13.1%
Nominal Financing Cost	5.0%	5.1%	11.8%
Real Financing Cost	3.0%	3.1%	1.5%
Time to Payout - Exploration	8	8	8
Time to Payout - Development	4	4	4

Endnotes

- ¹ See P. Bazel and J. Mintz, “2020 Tax Competitiveness Report: Canada’s Investment Challenge”, SPP Research Paper, Vol 14 (21), September 2021. As noted on page 21, Australia’s gross capital formation declined 0.4 per cent from 2015 to 2019, similar to Canada (-0.5 per cent) and far less than the United States (13 per cent), India (24.1 per cent) and France (15.7 per cent). Investment in Norway increased 16.4 per cent and in New Zealand 13.9 per cent in the same period.
- ² With population aging in most countries, saving and labour supply will not be able to keep up to investment demands. See C. Goodhart and M. Pradhan, *The Great Demographic Reversal*, Palgrave MacMillan, Switzerland 2020. The authors argue that economies will see rising real interest and inflation due to these factors. They recommend a number of policies including company tax reform.
- ³ See J. Chanis and B. Nelson, “Electric Vehicle Production And Critical Minerals Supply”, energyfuse.org, March 29, 2018 (<https://bit.ly/3A8V04M>)
- ⁴ Australia is estimated to have 4.1 megatonnes in rare-earth mineral reserves, sixth most in the world (China’s reserves are roughly ten times more, accounting for 38 per cent of total global reserves. <https://investingnews.com/daily/resource-investing/critical-metals-investing/rare-earth-investing/rare-earth-reserves-country/>).
- ⁵ Canada’s investment as a share of GDP did not fall as much due to strong investment in housing (see the discussion in Bazel and Mintz (2021), op. cit supra note 1). Like Australia, Canada’s company capital formation has declined sharply after 2014 due to both falling commodity prices and increased regulatory costs.
- ⁶ <https://www.pc.gov.au/research/ongoing/productivity-insights/long-term/productivity-insights-2020-long-term.pdf>.
- ⁷ The theory used to develop equations used to estimate the METR is provided in P. Bazel and J. Mintz, “2015 Tax Competitiveness Report: Canada is losing its attractiveness”, SPP Papers, 9(37), The School of Public Policy, University of Calgary, 2016.
- ⁸ In our analysis, we assume that any tax losses from marginal investments are deducted from inframarginal profits. In other words, government share both the gains and losses through the tax system, which is equivalent to a deduction for the cost of risk. For further explanation, see “The Corporation Tax: A Survey”, *Fiscal Studies*, Vol. 16. No. 4, 1995, pp. 23-68. Reprinted in *The Economics of Tax Policy*, edited by M. Devereux, Oxford University Press, London, 1996, pp. 127-188.
- ⁹ World Mining Data for 2019. <https://world-mining-data.info>.
- ¹⁰ Smelting is a manufacturing process that is not included as part of the mining extraction stage. For a description of the model, see J. Mintz, “Taxes, Royalties and Cross-Border Investments,” in *International Taxation and the Extractive Industries*, ed. P. Daniel et al. (Washington D. C.: International Monetary Fund, Routledge, New York and London, 2016).
- ¹¹ Data were obtained from the following source: <https://miningdataonline.com>.
- ¹² The company income tax has been found to be passed on by corporations as higher prices charged to consumers (Scott Baker, Stephen Teng Sun, and Constantine Yannellis, “Corporate Taxes and Retail Prices,” NBER Working Paper no. 27058, April 2020, <http://www.nber.org/papers/w27058>. or by reducing employment and wages paid to workers (McKenzie, K. and E. Ferede, “Who Pays the Corporate Tax?: Insights from the Literature and Evidence for Canadian Provinces” in *Reforming the Corporate Tax in a Changing World*, ed. by B. Dahlby, Canadian Tax Foundation, Toronto and School of Public Policy University of Calgary, 2018.
- ¹³ See by X. Rimmer, J. Smith and S. Wende, “The Incidence of the Company income Tax in Australia”, <https://treasury.gov.au/publication/economic-roundup-issue-1-2014/economic-roundup-issue-1/the-incidence-of-company-tax-in-australia>.
- ¹⁴ For a discussion of small business tax incentives and related distortions in G7 countries and Australia, see Jack Mintz, Patrick Smith and V. Balaji Venkatchalam, “A New Approach to Improving Small-Business Tax Competitiveness”, SPP Research Paper Volume 14(24), The School of Public Policy, University of Calgary, October 2021.
- ¹⁵ C. Slavik and H. Yazici. “On the Consequences of Eliminating Capital Tax Differentials.” *Canadian Journal of Economics*. February: 225-252, 2019.

