



Minerals industry tax survey 2016
Minerals Council of Australia

4 December 2016

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Dear James

2016 Minerals industry tax survey

Please find attached our draft report presenting and analysing the key findings of the 2014-15 industry tax data collection on behalf of the MCA.

Global commodity prices continued to track through a difficult period in 2014-15, with reductions in global demand meeting increases in supply. The effects were felt across the mining industry, with accounting profits falling sharply from previous years.

The effective tax ratio has tended to rise as profits have fallen. Across all minerals, the effective tax rate has increased to 54.3% – the highest recorded level in this survey.

We hope this analysis proves useful to the MCA.

Please do not hesitate to contact me should you have any queries.

Yours sincerely,



Chris Richardson
Partner

Deloitte Access Economics

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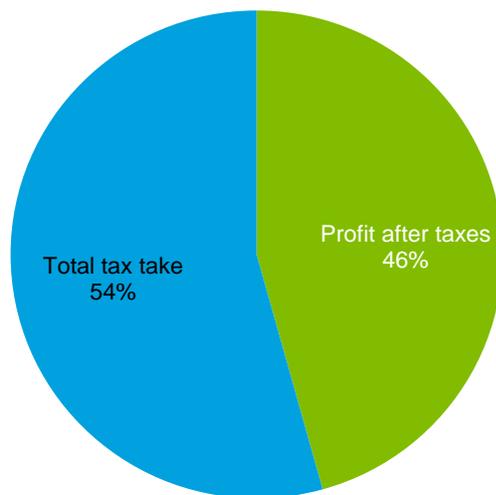
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Executive Summary

For the first time since the survey began in 2011, the 2016 MCA minerals industry tax survey finds that in 2014-15, miners paid more than half of their profits in taxes.

Chart i: Total tax take ratio, 2014-15 (all minerals)



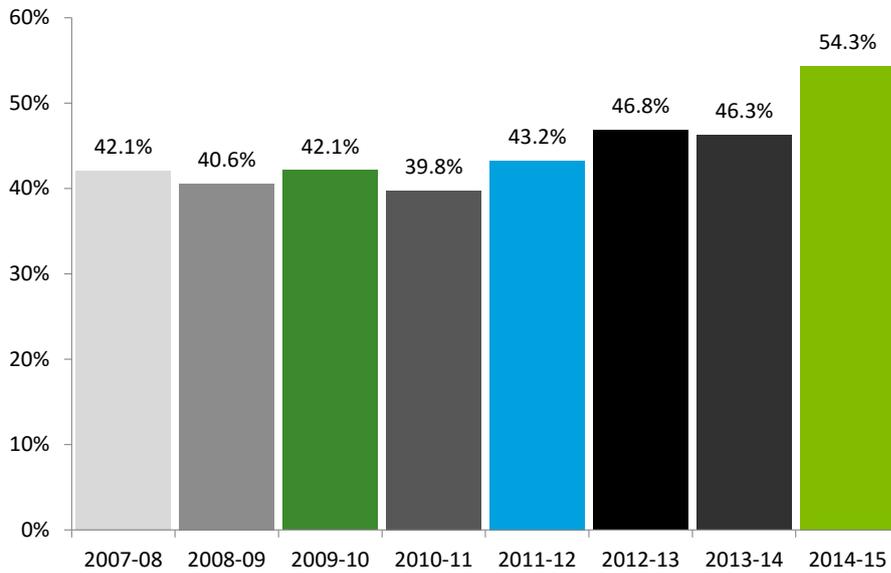
Source: MCA minerals tax survey, 2016

The latest data show an eight percentage point rise in miners' total taxes as a share of profits between 2013-14 and 2014-15.

All things considered, the survey tells a pretty bleak story for the minerals sector in 2014-15. Relative to the year before, incomes fell while expenses rose, causing profits to fall by an estimated 76%.

The ratio has shown a steady rise since the turn of the decade, from around 40% in 2010-11, to 54% in 2014-15.

Chart ii: Total tax take ratio 2007-08 to 2014-15 (all minerals)

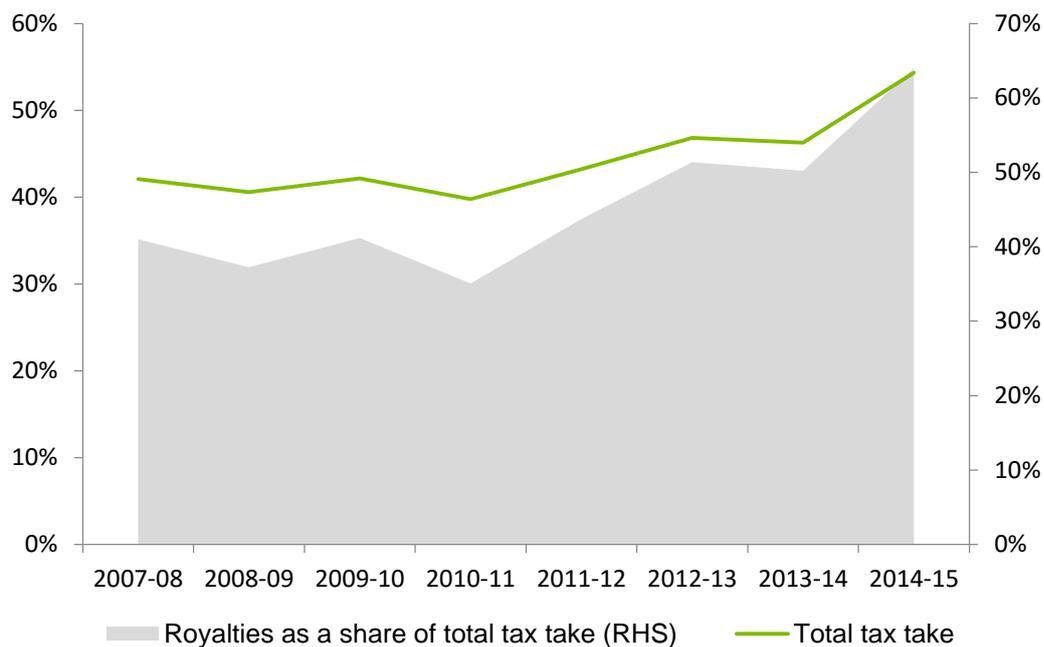


Source: MCA minerals tax survey, 2016 and earlier years

Note: Due to data revisions and sample changes estimates vary from year to year. Estimates for each year are taken from the most recent survey that provided data for that year.

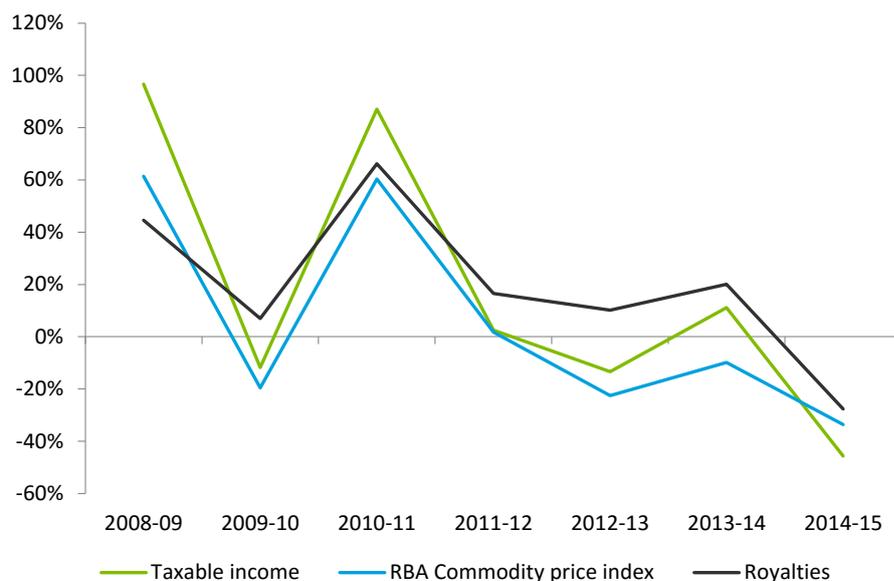
This survey marks a turning point for another reason. The past two surveys, reflecting fiscal years 2012-13 and 2013-14, showed the royalties ratio creeping up to and roughly matching the total tax ratio. The chart below shows royalties as a share of the total tax ratio since the survey began in 2007-08. The last two years, 2012-13 and 2013-14, saw royalties account for roughly half of the total tax take. This year's survey shows that, in 2013-14, royalties accounted for 64% of the total tax take. In value terms, miners paid nearly twice as much in royalties as they did in company tax.

Chart iii: Royalties as a share of total tax take, 2007-08 to 2014-15



The chart below compares growth in the corporate profit base (taxable income), the Reserve Bank of Australia's bulk commodity prices index (for non-rural commodities), and estimated royalty payments, since 2008-09 (the first year available from the survey). As the chart demonstrates, although royalties do move broadly in line with profitability, they are far less responsive. Taxable income, which ultimately drives company tax, tends to fluctuate to a greater degree.

Chart iv: Minerals profits and world bulk commodity prices



Source: MCA minerals tax survey, Reserve Bank of Australia

The upshot is that, as commodity prices and profitability decline, miners' tax contributions are becoming less related to their underlying profitability.

It is worth noting that in recent months prices have seen something of a turnaround. This may result in an improvement in the corresponding figures for the 2017 survey.

However, Deloitte Access Economics' most recent *Business Outlook* adds a cautionary note to recent high prices:

These industrial commodity prices may, on average, be half of what they hit at their 2011 peaks, but they are also spectacularly better than they were in early 2016 – so much better than they were, in fact, that some Australian coal producers are back making profits once more, as the combination of higher prices and lower costs has an impact.

Will it last? We've been bears for a long time, and see no real reason to change. Supply may have been slow, but it is coming – and much of it is low cost. Speaking of low cost, the success of many miners in cutting their costs has been spectacular, but economics in competitive markets is an inexorable force: those cost cuts will eventually show up as lower prices rather than higher profits.

Whether or not the recent price rises are sufficient to mark a turning point in this year's historically high overall tax take ratio is something that will only become known with time.

Deloitte Access Economics

1 Introduction and context

1.1 Background to the survey

The minerals tax survey is conducted on behalf of the Minerals Council of Australia, with the first survey being conducted in 2011. The survey provides insight into and analysis of the minerals industry's tax liabilities since 2007-08.

This year is the sixth such data collection. The survey is not intended to replicate other data sources, but rather to provide the MCA with its own independent and methodologically robust estimation of the minerals sector's tax burden.

The survey collects data for each of the three major commodity groups – coal, iron ore and gold mining – as well as for the total of Australian minerals operations.

1.2 Survey coverage

Company level production data were provided to the MCA by AME Mineral Economics were used to estimate the overall coverage of the survey in terms of percentage shares of total production. Participation in the survey fell from 27 companies in 2015 to 25 companies in 2016.

The continued strong coverage of the survey gives us confidence that the estimates presented herein are reflective of the prevailing conditions in the minerals sector as a whole.

The survey remains the most comprehensive analysis available of the minerals industry's tax contributions.

Table 1.1: Estimated MCA survey coverage

	Share of production	
	2015 survey	2014 survey
Coal*	75%	70%
Iron ore	80%	78%
Gold	71%	74%
All other minerals	54%	54%
Total	-	-

* in this year's survey coal mining is restricted to black coal

2 Industry tax survey results

2.1 Explanation of ratios

A key premise of this survey is that, in considering the tax burden, **it is best to focus on tax ratios rather than absolute tax dollars**. There are two key reasons for this:

- First, although there have been ups and downs, over time absolute tax dollars have grown due to the enormous growth in the demand for and price of industrial commodities; and
- Second, ratios abstract from the size of the sector and allow debate to focus on tax rates and the associated tax burden rather than absolute dollar values.

Hence the survey data are used primarily to calculate “tax take” ratios broadly comparable with those published by the Government from time to time.

Two ratios are presented – a total tax take ratio and a royalties ratio:

$$\text{Total tax take} = \frac{\text{Royalties from Australian mining operations} + \text{company tax}}{\text{Taxable income (or loss)} + \text{royalties}}$$

$$\text{Royalty take} = \frac{\text{Royalties from Australian mining operations}}{\text{Taxable income (or loss)} + \text{royalties}}$$

Adjusting the profit base (denominator) to account for royalties

The ‘original’ denominator of this calculation is taxable income. However, royalties are also considered to be the functional equivalent of a tax for the purposes of this survey (see Appendix A). Royalties, which ordinarily are expensed in a company’s accounts, are therefore added back to the denominator in order to calculate the tax ratios used in this survey. Failure to do this would mean that royalties are compared to a base from which they have already been deducted, leading to an overestimate of tax ratios.

The adjusted denominator is what we call *pre-tax taxable income*. Thus the ratios presented throughout this report express taxes (being company tax, royalties, and the sum of the two) as a percentage of *pre-tax taxable income*. The resulting company tax ratio is less than 30% solely on account of adjusting the profit base to include royalties.

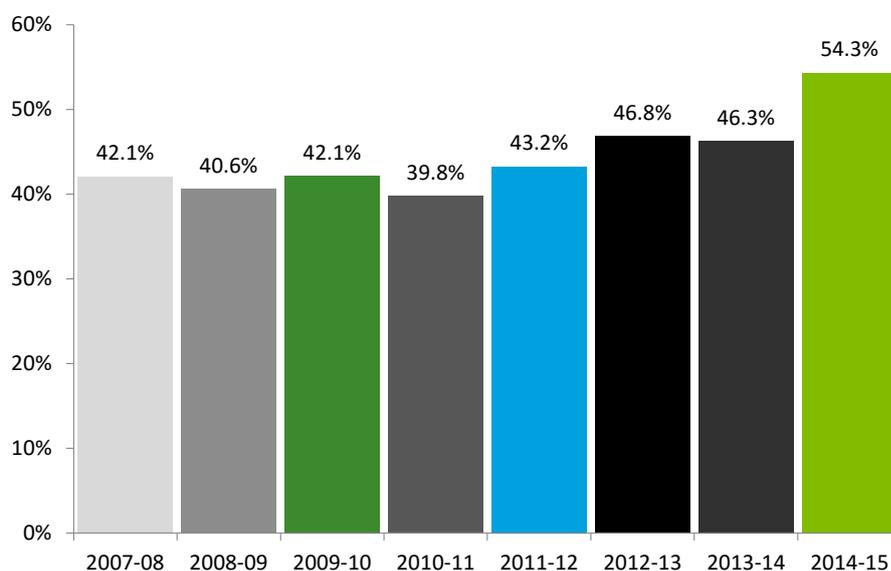
2.2 Key results

Last year's survey indicated some important trends between 2012-13 and 2013-14. In particular, while total incomes were stagnant, a strong element of cost cutting was apparent, with per unit expenses falling considerably.

This year's survey tells a more negative story, with world commodity prices falling further still, with the offsetting decline in the \$A being rather less than the matching fall in world prices, and with overall expenses rising:

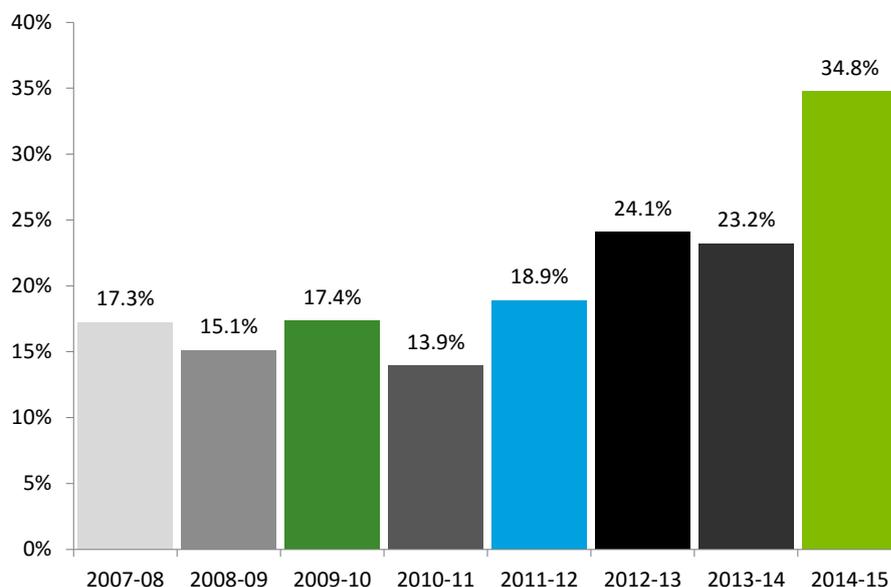
- Total sales income (proxied by 'all other income' in the survey instrument) fell by 11%, reflecting continually declining commodity prices.
- Those falling prices were partly (but not fully) offset by a falling dollar – the RBA's bulk commodity price index fell by 34%, whereas the dollar fell by 18% against the US dollar.
- Having risen slightly in 2013-14, the minerals sector's taxable profits halved in 2014-15 (noting though that this figure is an aggregate estimate, and as such does not explicitly consider commodity specific differences).
- Although the minerals sector remains profitable overall, it is important to note that many companies, especially smaller ones, make considerable tax losses. These losses are estimated to have risen considerably between 2013-14 and 2014-15.

Chart 2.1: Total tax take ratio (all minerals)



Source: 2016 MCA tax survey

Chart 2.2: Royalty tax take ratio (all minerals)



Source: 2016 MCA tax survey

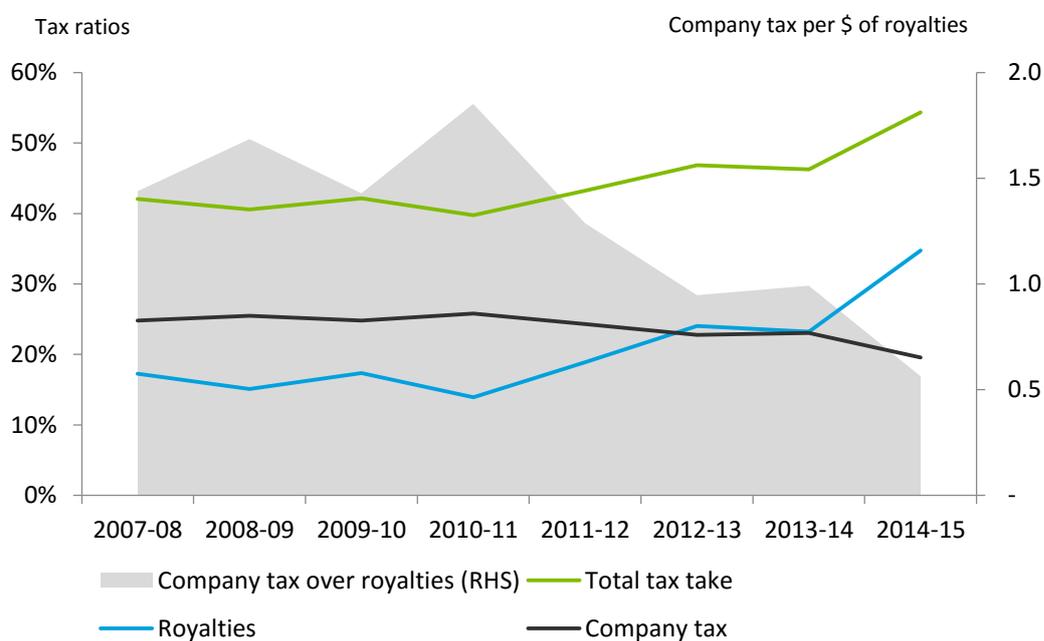
2.3 Trends

As shown in Chart 2.3, last year's survey (estimating data for the 2013-14 financial year) saw the effective royalty ratio exceed that of company tax for the first time since the survey began. It is worth noting the company tax ratio is less than 30% solely on account of royalties being included in the denominator.

This year's survey sees the royalties ratio considerably exceed that of company tax, by some 15 percentage points. Or, in other words, a period of rotten profitability made little difference to the share of profits paid by way of company taxes, because company tax is a profit tax. But royalties move more with revenues than they do with profits, meaning that they rise relative to profits when the latter drop.

The right hand axis of the chart below shows company tax payments for every dollar of royalties. When the survey began, company tax comfortably exceeded royalties by a factor of around 1.5. This figure peaked in 2010-11 at almost 2 (that is, company tax payments were twice as much as royalty payments). Since then however the ratio has been in a steady decline and reached its lowest point in 2014-15, with company tax payments only half that of royalties.

Chart 2.3: Comparison of tax ratios over time (all minerals)

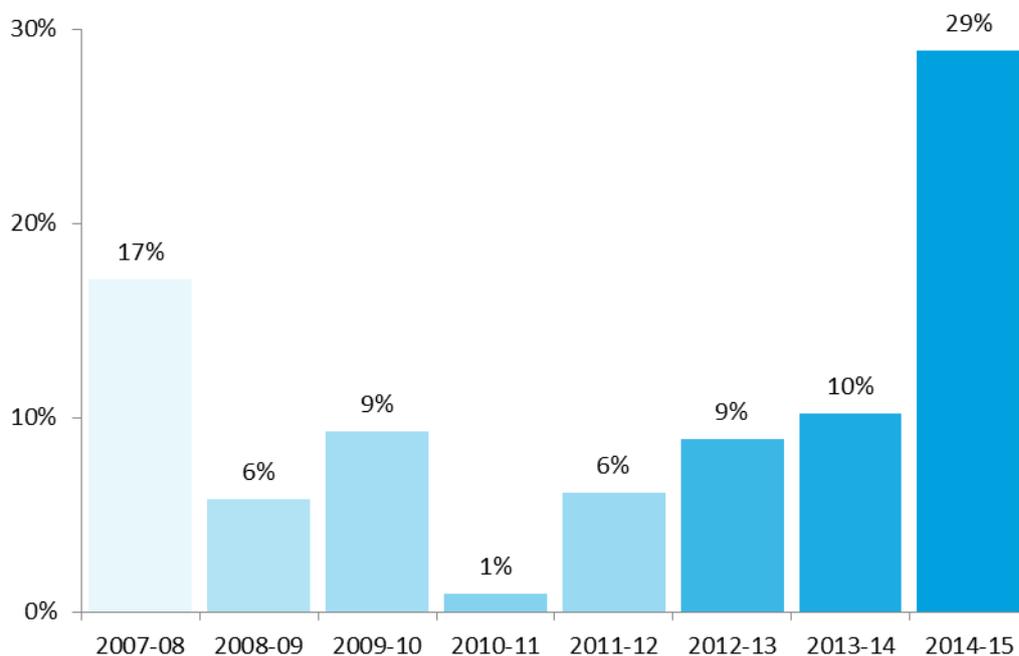


Source: 2016 MCA tax survey

That’s why royalties now account for over 60% of the industry’s total tax contribution.

It hasn’t always been that way – as the shaded grey area in the chart above indicates, company tax payments were nearly double royalty payments in 2010-11. But as commodity prices and hence taxable profits have declined, so too have company tax liabilities, leaving royalties to pick up an increasing share of the overall tax take. To explore this further, Chart 2.4 shows overall tax losses as a share of the corporate profit base. The tax survey is an amalgamation of a number of participating companies, some of which make a tax loss and others a profit. Thus, this chart takes the combined losses of those companies that made a loss, and divides it by the combined profits of those companies that made a profit. The resulting ratio, which has hovered around 10% in recent years, jumped to almost 30% in 2014-15.

Chart 2.4: Scale of tax losses as a share of industry wide taxable profits



Source: 2016 MCA tax survey

This not only highlights the significance of losses from an aggregate perspective, but also the inherent issue with royalties accounting for a greater share of the total tax take than company tax. Specifically, losses are the equivalent of nearly 30% of profits, and yet the companies incurring those losses are equally liable to pay royalties. Thus royalties themselves may be the difference between loss making and profit making.

2.4 What drives the tax ratios?

The table below summarises the change in key metrics behind the tax ratios between 2013-14 and 2014-15.

Table 2.1: Change in key metrics, 2013-14 to 2014-15

	Coal	Iron ore	Gold ¹	Total Australian mining
Total income	-1%	-29%	19%	-11%
Total expenses	11%	-6%	-25%	7%
Accounting profit	-	-53%	-	-76%
Taxable income	-	-46%	444%	-54%
Royalties	-6%	-28%	9%	-19%
Company tax	-	-46%	444%	-54%

2.4.2 Total income (commodity prices)

The most recent year covered by the survey – that is, the 2014-15 financial year – was a horror year for commodity prices. As demand from China slowed and supply of minerals kept increasing, the spot price of key commodities inevitably plummeted:

- The hardest hit was iron ore, which fell by some 44% over the course of 2014-15, following an 18% fall the year prior.
- Coking coal also saw considerable declines, with a 21% fall in 2014-15, following a 15% fall the year prior.

Table 2.2: Change in spot commodity prices

% change on year earlier	Iron ore	Coking coal	Gold
Jul-12	-33%	-37%	na
Jul-13	11%	-31%	-22%
Jul-14	-18%	-15%	6%
Jul-15	-42%	-21%	-12%

Source: CBA

The reasons behind these price falls have been well covered and it is worth noting that in recent times the spot prices have recovered somewhat. Against that backdrop it is perhaps no surprise then that estimated income for iron ore fell some 30% between 2013-14 and 2014-15.

Notably though, coal and gold mining didn't follow suit; overall income for coal mining fell only 1%, despite the spot price declining by 21%, while gold miners' overall income grew by an estimated 19%, despite the spot price of gold falling 12%. Of course, it is worth noting that spot prices are an imperfect predictor of overall mining income. Commodities are sold in bulk forward contracts with only limited amounts being sold on spot markets, while changes in volumes shipped are also part of the equation here.

Reviewing the relative changes in per unit income and expenses can shed some light on these results (Table 2.3). Focussing on gold mining, for example, income per unit of production grew by an estimated 21%. This may reflect that the relatively stronger gold prices through 2013-14 were above those that prevailed in 2014-15. But it is also clearly a cost story, with per unit expenses falling an estimated 31%. The combination of these effects is clearly behind the very strong rise in gold miners' taxable profits between 2013-14 and 2014-15.

¹ Higher percentage swings in the gold mining sector partially reflect its comparatively small scale.

Coal mining recorded a very strong increase in expenses in 2014-15. Though it is impossible to tell for sure, one explanation for this could be the purchase of new mining assets, with expenses recorded up front relative to income flows. Interestingly, the closest matching ABS data did not suggest such an increase. This may partly be a timing issue (some companies report on a calendar year basis while others report on a financial year basis, and it's possible that ABS data did not capture changes occurring late in the calendar year), or it may reflect some form of non-sampling error on the part of respondents. Irrespective of the reason though, the upward trend of the total tax ratio for coal mining would not have been affected.

Table 2.3: Change in income and expenses, 2013-14 to 2014-15

	% change 2013-14 to 2014-15
All other expenses	
Coal	12%
Iron ore	-19%
Gold	-31%
All other income	
Coal	0%
Iron ore	-39%
Gold	21%

2.4.3 Total expenses

From an industry wide perspective total expenses rose an estimated 7% between 2013-14 and 2014-15. This stands in contrast to last year's survey, which showed a 12% decline in overall expenses between 2012-13 and 2013-14.

Thus, similar to last year's survey, from an industry wide perspective, the movements in the total tax ratio include an important cost story – a fall in revenues combined with an increase in expenses led to the total tax ratio jumping above 50% for the first time since the survey began.

2.4.4 Taxable income (and adjustment items)

The corporate profit base (that is, taxable income) is obviously a primary driver of the underlying tax ratios. As noted above, taxable income generally shows a counter-cyclical relationship with the tax ratios – higher taxable income means a lower denominator and thus a lower tax ratio, and vice versa.

Broadly speaking, the same income and expense aggregates that affect accounting profit will equally affect taxable income. Yet taxable income is not the same as accounting profit, so it is necessary to reconcile accounting profit or loss to taxable income or loss through the addition and subtraction of certain items:

- '*Addition items*' tend to increase taxable income relative to accounting profits. Examples of '*addition items*' include franking credits, net capital gains, and expenses that are recorded in a company's accounts but are not deductible for tax purposes.
- '*Subtraction items*' tend to reduce taxable income relative to accounting profits. A prime example of a '*subtraction item*' is prior year tax losses, which while not recorded on a company's financial statements, can be used to offset current year tax liabilities. Other examples include capital works deductions, and non-taxable income.

The distinction between accounting profits and taxable income highlights the broader distinction between items which are 'tax' concepts and items which are 'accounting' concepts. Since the purpose of this survey is to collect tax data, the correct comparator for ratio purposes is the 'tax'

concept of profits – that is, taxable income, or the corporate tax base – and not the ‘accounting’ concept of profits.

While the two should generally move in line with each other over the long term, occasionally cyclical factors will mean that the two may not shift in parallel, and as such ratios using accounting profits and not taxable income could potentially misstate the true tax burden of the sector.

2.4.5 Royalties

Royalties are essentially levied on minerals companies’ gross income, not their profits. This has generated the counter cyclical relationship between royalties and the corporate profit base (and hence overall tax take ratios) over the past few years. From an overall industry perspective, while the corporate profit base fell by 54%, royalty payments declined by less than half that amount.

As noted above, a further comment can be made regarding the fact that all companies, even those making a loss, are obliged to pay royalties. As profits fall, the tax take ratio tends toward infinity, and royalties contribute a larger share of miners’ overall tax contribution. And, of course, when profits become a loss, royalties themselves make up 100% of companies’ tax contributions.

At a time when overall losses are making up an increasing share of overall profits (29% in this year’s survey, as Chart 2.4 above showed), the possibility that royalties themselves may in fact exacerbate the financial situation of loss making entities is worthy of consideration.

2.5 Changes from last year’s survey

This year’s survey collected data for the 2013-14 and 2014-15 financial years. As with previous years, there is an overlap between the data provided for years 2013-14 and that provided this year. Analysis of the difference provides us with an understanding of the overall voracity (and stability) of the underlying tax ratios.

Three factors explain the variation in 2013-14 data between this year’s survey and last year’s survey:

- First, some companies that participated in the 2014 survey did not participate in this year’s survey.
- Second, some 2013-14 data were revised between this year’s and last year’s survey. This is especially the case for companies that report on a calendar year basis (that is, CY 2014 and CY 2015), as the CY 2014 data provided in last year’s survey were often preliminary.
- Third, some companies participated for the first time in this year’s survey.

Table 2.4 breaks down the differences in 2013-14 results from last year’s and this year’s survey into the three sources of change described above. The table shows that the effect of drop outs was the dominant driver of re-estimated 2013-14 results. Ultimately though, the combined effect of these revisions was negligible, with a less than one percentage point impact on the underlying tax ratios.

Table 2.4: Changes for 2012-13 between 2013 and 2014 surveys (all minerals)

Change in key calculation items				
	Data revisions	Drop outs	Newcomers	Total change
Royalties	-0.25%	-3.85%	0.18%	-3.91%
Company tax	0.14%	1.41%	-1.01%	0.52%
Total tax take	-0.06%	-1.29%	-0.41%	-1.76%
Taxable income before royalties	0.05%	0.14%	-0.74%	-0.55%

2013-14 tax ratios				
	Last year's estimate	Data revisions	Drop outs	Newcomers
Royalty tax take	24.04%	23.08%	23.01%	23.22%
Company tax take	22.79%	23.08%	23.10%	23.03%
Total tax take	46.83%	46.15%	46.11%	46.26%

Source: 2016 MCA tax survey

Appendix A: Are royalties taxes?

In the minerals tax debate of 2010 the charts released by the Treasury included royalties in with resource and other taxes in considering the minerals sector's total contribution to the coffers of the public sector. Accordingly, Treasury referred to "Resource taxes (such as royalties, PRRT, crude oil excise and the RSPT)"² in putting together its figures.

Yet some commentators have argued that royalties are not a tax, and so should not be included in ratios aimed at assessing the tax liabilities of the minerals sector.³

So how many angels are dancing on the head of that particular pin? The debate over whether or not to classify royalties as a tax, a charge, a levy, or something else, is of little consequence. As the IMF puts it:

*"From the perspective of the investor, of course, it makes little difference whether a payment is called a royalty or a tax: the economic impact is the same. In terms of policy design too whether one thinks of a royalty as akin to a user fee or as an explicit tax, the determination of its proper level and time path reduces to the same question."*⁴

As the IMF also notes, what actually matters is the extent to which royalties share similar characteristics to taxes.

The primary purpose of royalties is to allow the community a return on the use of its raw mineral deposits. In that context to argue that royalties are not a tax is also to argue that the PRRT, MRRT, or the originally proposed RSPT, are not taxes either – despite all of them having 'tax' in their names.

A number of reputable commentators – including the Henry Review itself, ABARE, Ross Garnaut, Henry Ergas, Ben Smith and others – have all discussed the current royalties regime. Yet none of those contributors to the debate have countenanced the view that royalties do not form part of miners' total tax contributions.

Just like other taxes that affect miners, royalties are levied to ensure the community gets a slice of mining companies' revenue. And, just like other taxes, royalties themselves can be useful policy levers. In particular, royalties can help ensure the extraction of that resource occurs at an optimal rate (a point also made by the IMF in 2010).

To suggest that royalties are not a tax is to overlook the many similarities that royalties share with other taxes.

² See http://www.aph.gov.au/~media/Estimates/Live/economics_ctte/estimates/bud_1011/Treasury/answers/BET6.ashx.

³ See for example this article in the *Sydney Morning Herald* in response to the latest MCA tax survey: <http://www.smh.com.au/business/a-taxing-tale-of-two-peak-bodies-20150101-12gcty.html>.

⁴ Phillip Daniel, Michael Keen and Charles McPherson, IMF (2010), *The taxation of petroleum and minerals: principles, problems and practice*, <https://www.imf.org/external/np/seminars/eng/2010/tax/090910.htm>.

Appendix B: Survey background

B.1. Background to the survey

In late 2010, the Minerals Council of Australia (MCA) recognised the importance of industry analysis and reporting of tax data for the purpose of current and future tax debates. An industry data collection was instigated, with the aim of generating tax ratios that are timely and transparent.

Deloitte Access Economics was engaged by the MCA to assist with conducting the survey. The first survey was undertaken in 2011. The survey collected financial information in relation to the direct resource taxes paid to Australian governments on account of the local mining operations of minerals companies. Results were publicly released in September 2011.

The current survey is the fifth tax data collection. It updates and extends on surveys from previous years, with data now available stretching back to 2007-08 (respondents in the first survey were asked to provide three years' worth of data; respondents in all other surveys are asked to provide the most recent two years' worth of data).

The focus of the survey is on the minerals sector (excluding oil and gas) and on mining operations (extraction) in particular – distinguishing between the main commodity groups of coal mining, iron ore mining, gold mining and other metals mining.⁵ Furthermore, this information is required only in relation to the mining of minerals in Australia.

The main data being collected relate to resource royalties and company tax, with the other financial data requested providing the basis for calculating a pre-tax "profit" figure against which to compare resource tax payments.

All the financial information collected is derived from a company's annual tax return – being information generally accessible (and dissectible) by a company's tax group. While the requisite information is readily available at the company level, completing the survey requires such information to be allocated across the key commodities/activities and across locations.

The focus of the survey is on mining operations (extraction). Fundamentally, this excludes the refining or smelting of minerals or ores (other than preliminary smelting of gold), or the manufacturing (processing) of products of mineral origin such as coke or cement. These excluded activities are in the nature of manufacturing, not mining.

The companies surveyed were also asked to exclude from the data they reported:

- all oil and gas activities, on the grounds that the MCA's focus is on minerals rather than petroleum products;
- all offshore activities, on the grounds that the focus of the data collection is on taxes paid to Australian governments which, by their nature, do not reflect mining activities undertaken outside Australia;

⁵ Mining can also involve the extraction of non-metallic minerals. This category was excluded from the survey on the grounds that it is not a significant category for resource taxation purposes.

- any exploration activity or other mining support activity, on the grounds that resource rents by their nature arise on account of extraction of minerals or ores rather than any preceding exploration activity or any downstream or support activities; and
- any non-mining activities.

The companies surveyed were asked to report data in relation to their mining operations for each State and/or Territory in which they operated.

The confidentiality undertaking signed by both the MCA and Deloitte Access Economics for the assurance of companies surveyed means that the survey data collected at an individual company level cannot be disclosed under any circumstances. Survey data have been analysed solely in aggregate form.

B.2. Calculating tax take ratios

The aim of the tax data collection is not to derive population estimates of total amounts (as is the purpose of 'official' minerals industry data published by the ABS). Rather, the aim is to derive **ratios** that convey an insight into the tax liabilities incurred in respect of Australian minerals operations.

A key premise of this approach is that in considering the tax burden **it is best to focus on tax rates rather than absolute tax dollars**:

- Although there have been ups and downs, over time absolute dollars have grown due to the enormous growth in the demand for and price of industrial commodities.
- Ratios provide a more accurate measure of tax burden. Ratios abstract from the size of the sector and allow debate to focus on tax rates and the associated tax burden.

Hence the survey data are used primarily to calculate "tax take" ratios broadly comparable with those published by the government from time to time.

B.3. Choice of denominator for the tax take ratios

Rather than comparing taxes paid with "resource rents" (which are unobservable), the analysis from this report instead compares dollar levels of tax collection with a more transparent and widely-accepted measure of corporate profits, namely the corporate tax base – the ATO's measure of taxable income.

Specifically, it uses taxable income *plus* royalty expenses. The 'original' denominator is taxable income. However as noted in Appendix A, royalties are also considered a tax for the purposes of this survey. Royalties, which ordinarily are expensed in a company's accounts, are therefore added back to the denominator in order to calculate the ratios used in this survey. Failure to do this would mean that royalties are compared to a base from which they have already been deducted, leading to an overestimate of tax ratios.

Note that taxable income is not the same as accounting profit. Thus it is necessary to reconcile accounting profit or loss to taxable income or loss through the addition and subtraction of certain items:

- '*Addition items*' tend to increase taxable income relative to accounting profits. Examples of 'addition items' include franking credits, net capital gains, and expenses that are recorded in a company's accounts but are not deductible for tax purposes.
- '*Subtraction items*' tend to reduce taxable income relative to accounting profits. A prime example of a 'subtraction item' is prior year tax losses, which while not recorded on a company's financial statements, can be used to offset current year tax liabilities. Other

examples include capital works deductions, small business and general business tax breaks, and non-taxable income.

The distinction between accounting profits and taxable income highlights the broader distinction between items which are 'tax' concepts and items which are 'accounting' concepts. Since the purpose of this survey is to collect tax data, the correct comparator for ratio purposes is the 'tax' concept of profits – that is, taxable income, or the corporate tax base – and not the 'accounting' concept of profits.

While the two should generally move in line with each other over the long term, occasionally cyclical factors will mean that the two may not shift in parallel, and as such ratios using accounting profits and not taxable income could potentially misstate the true tax burden of the sector.

B.4. Choice of numerator for the tax take ratios

The survey collects data for each of the following tax payment variables, which enable calculation of tax take ratios:

- Royalty expenses within Australia, as reported in the annual company tax return; this amount generally involves an accrual/payable amount.
- Australian gross company tax payable, being 30% of 'taxable income'; this amount generally involves an accrual/payable amount. This is the figure used for company tax in the tax take ratios.
- Australian company tax *actually paid* during year; this amount reflects both cash payments made during a year, and any rebates/tax offsets and tax credits, and so can differ in any one year.

With regard to the second dot point above, note that the gross tax payable figure used in calculation of the tax ratios is not 30% of positive taxable income, but 30% of aggregate taxable income, and therefore is net of current year tax losses. Although current year tax losses have the effect of reducing *actual* tax payments in future periods, in accrual terms, their effect is to reduce the tax liability *with respect to the current period*.

With regard to the third dot point, on account of various rebates, tax offsets and credits, as well as potential timing effects, the amount of tax actually paid in any one year may differ substantially from gross company tax payable. This series can be highly volatile, and the effects of timing differences mean it cannot be ascertained for certain which period actual tax payments relate to.

For this reason the company tax figure that is used in the numerator for the tax ratios published in this report is gross company tax payable, not company tax actually paid.

Rather than just focussing on royalties and other resource-specific taxes, the reporting of the survey's findings is based on the premise that the minerals tax take should be measured as the combined impact of all taxes, including company tax.

The main fiscal instruments used to collect resource revenues in the minerals sector are mainly State and Territory royalties and Commonwealth company income tax.

B.5. The potential for errors

Over the years of its operation to date, the tax data collection survey has an established (and effective) procedure for ensuring that all companies' returns are as accurate as they can be. That said, some degree of error is inevitable in any survey.

This section discusses the potential for both sampling and non-sampling errors to occur, as well as the procedures in place to minimise the scope for such errors.

B.6. Sampling error

B.6.1. Companies providing data on different reporting periods

The methodology set out in Appendix C ensures that the data being reported relate only to the specific financial years in question, and hence relate only to market conditions that prevailed in the specific financial years under examination.

Each year, the survey asks companies to provide data in respect of their two most recent financial years – that is, the current survey sought data in relation to 2014 and 2015 (either calendar year or the equivalent financial year). For companies that reported on a calendar year basis, their returns were converted to a consistent financial year basis using the procedure detailed in Appendix C

By definition, it is virtually impossible to ever truly assess the accuracy of the financial year estimates – put simply, a company which reports on a calendar year basis is unlikely to provide data on a financial year basis, meaning we are unlikely to ever know the ‘true’ financial year values for those companies.

An alternative would be to seek data in relation only to a specific reporting period. Preliminary consultations with some companies when the survey commenced indicated that the larger companies would likely be able to convert their own data to a consistent reporting period.

However, there are two issues with this:

- First, Deloitte Access Economics would effectively lose control (and knowledge) over the methodology employed by individual companies in converting their data. In our judgement, it is better to apply a consistent (and transparent) methodology for all companies, such that the methodology ultimately employed, and as set out in Appendix C, is a matter of public record.
- Second, we would likely sacrifice some sample size, since not all companies would be able (or willing) to convert their data to a consistent reporting period.

We estimate that companies who report on a calendar year basis represent roughly half of the total sales revenue of the survey sample, meaning that roughly half of the companies’ sales data were converted into their financial year equivalents.

Also, one company provided data for the year ending 31 March. Given that this reporting period is really only one quarter ‘out’ on either side of the desired reporting period (that is, year ending 30 June), it was decided not to adjust this company’s data, on the grounds that any attempt at adjusting that data risked creating more errors than it attempted to solve.

We remain confident in the soundness of our estimation methodology, and the fact that changes in the sample of companies surveyed has not, over time, generated significant increases or decreases in the ultimate ratios presented, gives us further empirical confidence that the survey results are accurate.

B.7. Non-sampling error

B.7.1. Non-sampling error by respondents

Inaccuracies in reporting by survey respondents can give rise to non-sampling errors. In particular, the survey very deliberately asks companies to exclude from any data they provide amounts that relate to non-mining activities, oil and gas activities, exploration or mining support activities, offshore activities, and the share of any joint venture amounts attributable to other companies.

To the extent that some amounts relating to the above items may inadvertently have been included in survey responses, some degree of non-sampling error is possible. That said, being in its fifth year, we are confident that respondents are fully aware of the specific requirements of the current survey.

A more likely source of non-sampling error from respondents lies in the requirement that data be separated into specific commodity groups (coal, iron ore, gold and all other minerals) that may not explicitly correspond with companies' internal reporting procedures. It should also be noted that in some cases amounts relating to gold may also include small amounts of other minerals – such as copper or silver – where such minerals are effectively a by-product of gold production.

Where companies indicated that their commodity level data breakdowns may be a cause for some concern, or where companies were unable to allocate some financial items across commodities or States, follow up correspondence with the relevant companies was conducted until a satisfactory conclusion was found.

More broadly, to minimise non-sampling error by respondents, considerable effort was allocated to manual 'checking' by Deloitte Access Economics of each company's survey return. This involved comparing reported data with published total where appropriate, as well as conducting a series of 'sense checks' on the data (for example, ensuring that returns were internally consistent). Any issues identified were followed up with individual companies.

B.7.2. Non-sampling error by Deloitte Access Economics

Where necessary, manual adjustments were made to survey returns to ensure consistency with totals or where the respondent (or Deloitte Access Economics) had concerns with the accuracy of a particular component of the survey. All such adjustments were discussed both internally and with the relevant company so as to ensure the appropriateness of the adjustment employed, and a record was kept of all adjustments made.

Deloitte Access Economics maintains internally documented procedures for all of the 'standard' estimation methodology in relation to this survey (such as the standard reporting period conversion discussed in Appendix C). Any and all adjustments made during the 'data checking' phase were recorded so that they can be reviewed in future surveys as necessary. A first step in the 'data checking' phase is to review the notes made last year in relation to any manual adjustments.

Appendix C: Estimating a standard reporting period

Companies participating in the survey differ in the reporting periods used for their financial data. As the annual period covered by official economic and financial statistics in Australia generally relates to the 12 months ending 30 June, for the sake of comparison it is most convenient if all data are converted on a standardised basis reflecting trading conditions in the 12 months ending 30 June.

One option is simply to aggregate data from both types of reporting periods. In this case, however, the estimates would reflect trading conditions prevailing in periods outside the 12 months ending 30 June in the relevant year.

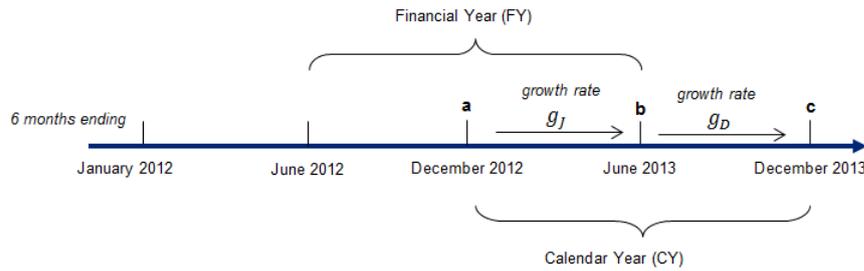
As an alternative, for a company providing calendar year financial information (CY), the arithmetic mean (or mid-point) of each pair of consecutive CY values could be used to approximate the associated amount for the financial year ending 30 June (FY). For example, for the series in the table below, the arithmetic mean of the 2011 CY and 2012 CY values (1,070 and 779 respectively) is 925. However, it is evident that this approach has limited merit as it can result in a FY estimate that is quite different to the actual value (with the observed FY value for the year ending 30 June 2012 in this example being 751 compared with the arithmetic mean of the 2011 CY and 2012 CY values of 925).

	2011	2011	2012	2012
Irregular growth series	Jan- Jun	Jul- Dec	Jan- Jun	Jul- Dec
Series	597	473	278	501
Half-yearly growth rates			-41%	80%
12 months ending 30 June (FY)			751	
12 months ending 31 December		1,070		779

If the half yearly growth rates for the relevant series were similar, then taking the arithmetic mean (in the table above, 925 – the average of 1,070 and 779) would provide a reasonable approximation of the FY value. But in an industry as volatile as the minerals sector, the observed half yearly growth rates are rarely consistent, meaning the arithmetic mean is a less reliable guide than otherwise.

As an alternative, Deloitte Access Economics has derived a formula which takes into account differing half yearly growth rates and will, where the requisite growth rates are known, provide the correct FY value.

We begin by noting that the calendar year comprises the sum of two six month periods, b and c, while the financial year is made up of periods a and b (see the figure below).



The known growth rates between each of these six month periods (g_J and g_D) allow us to trace-back the calendar year data to arrive at a financial year estimate. First we start with,

$$\begin{aligned} CY &= b + c \\ &= b + (1 + g_D)b \\ &= b(1 + (1 + g_D)) \end{aligned}$$

Re-arranging,

$$b = \frac{CY}{1 + (1 + g_D)}$$

Now, turning to the six month period a ,

$$\begin{aligned} a &= \frac{b}{1 + g_J} \\ &= \frac{CY}{(1 + g_J)(1 + (1 + g_D))} \end{aligned}$$

Now it is possible to combine these results to express the financial year in terms of the calendar year value and the two half-yearly growth rates:

$$\begin{aligned} FY &= a + b \\ &= \frac{CY}{(1 + g_J)(1 + (1 + g_D))} + \frac{CY}{1 + (1 + g_D)} \end{aligned}$$

$$FY = CY \left(\frac{1 + (1 + g_J)}{(1 + g_J)(1 + (1 + g_D))} \right)$$

Of course, in estimating FY values for individual companies, the requisite half yearly growth rates are rarely known. As an alternative, we use the observed half yearly growth rate in either the company's volume or value of production, or, where such data are not available, the implied half yearly growth rates from Department of Industry data.

The resulting estimates are then subject to a comprehensive internal 'sense check' to ensure the calculation has provided a reasonable figure. While not perfect, given the volatility in half yearly growth rates observed in the minerals sector, we are confident that in normal circumstances, this is a superior methodology than the alternatives (that is, using a simple average or simply not converting data to a consistent reporting period).

Where companies' taxable income has switched from positive to negative over a given period however, the adjustment factor described above can yield results which are contrary to expectations. Where this occurs, a simple average of the relevant calendar years often produces a more sensible result. Judgement is applied in all such instances to ensure the resulting financial year estimate is the best possible.

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