

How much should we have in resource stocks?

Tim Farrelly | farrelly's | 14 October 2016

One of the regular complaints about the Australian sharemarket is that it is too exposed to the major banks and to the resources industry. We concur. farrelly's considers the index weights to be something of an accident of history and geography and not something that needs to be followed slavishly. Leaving aside the banks, which are currently very attractively priced, we believe that resources weights in portfolios should be much lower than the weights implied by the All Ordinaries Index.

DO RESOURCES DIVERSIFY?

Being cyclical entities, resources are clearly more volatile than industrials, as shown in Figure 1 below. Further, their presence in the All Ordinaries Index lifts the volatility of that index above that of the All Industrials index.

Figure 1: Volatility of various sectors of the Australian market

Sector	All Ordinaries	All Resources ¹	All Industrial ²
1979 – 2000	19.7%	26.9%	17.6%
2000 – 2016	13.1%	21.5%	12.9%
1979 – 2016	17.0%	24.5%	15.7%

Source: ASX, S&P, farrelly's calculations. Notes. 1. Metals & minerals + Energy. 2. All Ords Ex Resources.

However, this of itself does not make resource stocks an inherently undesirable sector of the market. A volatile asset that consistently has low correlation with other assets can substantially lower overall volatility in times of stress.

To test this, firstly, we looked at what the optimal weighting to resources would be in order to minimise the volatility of an Australian Equity portfolio over different periods. Secondly, we looked at the performance of resources and industrials during times of market stress to test whether during those times, the resources provided meaningful protection. Note that neither of these measures takes into account return potential – merely the potential for risk

reduction. Return potential will be examined separately, both from a historical and forward-looking perspective.

Figure 2 shows the optimal weights to resource stocks that minimise portfolio volatility over various periods.

Figure 2: Weight to resource stocks that will minimize sector volatility

Period	1979 to 2016	1979 to 2000	2000 to 2016
Minimum volatility weight	4%	0%	11%
Reduction in volatility	15.72% to 15.70%	0.0%	13.0% to 12.8%

Source: ASX, S&P, farrelly's calculations. Notes. 1. Metals & minerals + Energy. 2. All Ords Ex Resources.

These results don't suggest that resources do much to reduce volatility. Over the whole period, the optimal weight to resources was just 4%. Over the past 16 years, the optimal weight was 11% – meaningful, but much less than the index weight. In both cases, the reduction in volatility is almost invisible to the naked eye.

Figure 3 is much more interesting. It looks at the protection provided by holding resources during major market downturns. The answer seems to be that it helps almost as often as it hurts but, when it helps, it helps only a little and when it hurts, it hurts a lot.

Figure 3: Performance of the Australian market during downturns³

Bearmarket dates	All Ordinaries	All Resources ¹	All Industrials ²	Impact of being market weight Resources
Jan 64 to Sep 65	-17.7%	-5.8%	-19.2%	+1.5%
Jan 70 to Nov 71	-34.7%	-60.6%	-20.1%	-14.6%
Jan 73 to Dec 73	-30.3%	-39.6%	-26.4%	-3.9%
Mar 74 to Oct 74	-44.7%	-32.3%	-47.4%	+2.7%
Aug 76 to Nov 76	-17.3%	-21.9%	-15.5%	-1.8%
May 81 to Jun 82	-31.2%	-49.0%	-11.5%	-20.6%

Sep 87 to Mar 88	-35.9%	-44.8%	-30.5%	-5.4%
Jan 90 to Dec 90	-19.0%	-17.0%	-20.2%	+1.2%
Jan 94 to Jan 95	-17.8%	-19.2%	-19.8%	+2.1%
Jan 02 to Feb 03	-15.7%	-7.7%	-17.1%	+1.4%
Oct 07 to Feb 09	-48.3%	-39.8%	-49.7%	+1.4%
Mar 11 to Sep 11	-15.5%	-24.9%	-10.5%	-5.0%
Mar 15 to Feb 16	-12.2%	-28.7%	-10.8%	-1.4%

Source: ASX, S&P, farrelly's calculations. Notes. 1. Metals & minerals + Energy. 2. All Ords Ex Resources 3. For dates prior to 1979, downturns are price only. After 1979 downturns include dividends.

An optimist might say that the resources exposure helps enough of the time to be worthwhile. Perhaps. Another way of looking at this would be to compare holding resources with a strategy where any time a market fell by 20%, you took 5% of the portfolio down to the casino and had a bet on the red. About half of the time, it has made things better; about half of the times, it has made things worse. But, the resources bet seems worse than this. When we win, we win less than when we lose. This is like taking 5% of the portfolio to a crooked casino.

As far as a hedge against market volatility is concerned, mark resources as a fail.

Energy producers may provide a hedge against energy price inflation

There are risks other than volatility. Risks are always considered more accurately through the prism of an investor's liabilities. A risk faced by most investors is rising energy prices which impacts not just fuel costs but the price of a whole range of goods that use energy in production. Synthetic materials and air travel are two prime examples. In terms of direct energy costs, Australian households' average expenditure represents 5.3% of total gross weekly household income (2.0% for dwelling energy and 3.2% for fuel for vehicles.)

Oil producers definitely provide a hedge against oil price increases which are a significant part of energy costs. However, oil is not as significant as it was in the 1970s and 1980s when rising oil prices had major consequences on the overall level of inflation. Since 1980, the quantity of oil needed to produce a unit of GDP in developed countries has fallen by 85%. To put it another way, the influence of oil prices on inflation was six times as high in 1980 compared to today. To hedge against the risk of rising oil prices requires one sixth of the allocation to energy stocks today than would have been necessary in 1980. Furthermore, the other big drivers of energy costs for most Australians and New Zealanders are electricity and

gas which have seen massive increases in real terms that, in Australia at least, have been mostly due to inept regulation of utilities rather than rising oil or coal prices. For these increases, resource stocks have provided no offset at all.

On this basis, we don't need much more than a 3% to 5% exposure to energy stocks to offset the risk of rising energy costs.

Iron ore and metallurgical coal producers provide a hedge against – well, not much, actually

Steel and metallurgical coal mining make up a large part of the value of the Australian resources sector. However, because few Australians have much of an exposure to steel prices, these types of stocks don't protect investors against anything much and so must be included in a portfolio purely for their return potential.

Resource stocks are not an inflation hedge

Throughout the inflationary 1970s and 1980s, the resources sector provided less inflation protection than industrial stocks. So, no magic here. Even if we focus on gold stocks, we find the same result. For example, \$10,000 invested in gold stocks in late 1980 was worth \$10,020 some 10 years later – or, in real terms, \$4,600. In the decade between 2000 and 2010 when inflation was declining, \$10,000 invested in gold shares turned into \$85,000, or \$64,000 in real terms. Whatever else they may be, resource and gold shares are not an inflation hedge. All in all, it is difficult to make an argument for including more than 5% to 10% in resources stocks on risk reduction grounds which, of course, is much lower than their index weight.

ARE RESOURCES STOCKS A WORTHWHILE INVESTMENT IN THEIR OWN RIGHT?

If risk reduction is not the driver, then the resources sector must earn its spot in the portfolio on return prospects. Here, we'll look at resource stock returns from both a historical and forward-looking perspective.

Past performance isn't everything, but there are certainly lessons to be learned. Since 1960, resources have underperformed industrials by 2.4% per annum. But, as usual, the average disguises some much more interesting information. In Figure 4, we see that inside that 55-year period, there have been three resources booms during which resources stocks dramatically outperformed industrials. Outside of these periods, there were long periods of equally dramatic underperformance. Clearly, the decision as to whether or not to be in resources stocks is a critical one for those concerned with relative performance. It is not difficult to see why fund managers would be reluctant to maintain large underweights to resources on a permanent basis.

Figure 4: Performance of Industrials and Resources during booms and busts

Sector	Years	All Resources ¹	All Industrials ²	Relative Performance
	1961 to 1969 8 year boom	28.3%pa	8.8%pa	+19.6%pa
	1969 to 1977 8 year bust	-10.5%pa	4.2%pa	-14.8%pa
	1977 to 1980 3 year boom	36.0%pa	25.1%pa	+10.9%pa
	1980 to 2000 20 year bust	6.3%pa	16.8%pa	-10.5%pa
	2000 to 2010 10 year boom	18.8%pa	5.8%pa	+12.9%pa
	2010 to 2016 6 year bust	-9.4%pa	13.1%pa	-22.4%pa
	1961 to 2016	9.3%	11.7%pa	2.4%pa
Average resources out-performance during booms				+14.0%pa
Average resources under-performance during busts				-15.9%pa

Source: ASX, S&P, farrelly's calculations. Notes. 1. Metals & minerals + Energy. 2. All Ords Ex Resources 3. For dates prior to 1979, returns are based on average monthly indices.

Given the scale of the performance difference during booms and busts, the average difference in performance of 2.4% per annum over the whole period could well be a statistical anomaly. On the other hand, Figure 4 does suggest that, if the current bust has come to an end, it has been unusually short.

Optimal weights to maximise performance

The impact of including resources at market capitalisation weights in the All Ordinaries Index, was to reduce returns by 1.1% per annum over the 55-year period. This is much larger than expected. If the average resources weight was 25% then a 2.4% per annum underperformance should translate to a 0.6% underperformance by the All Ordinaries. This unfortunate outcome is the result of rapidly increasing weights to resources during booms resulting in maximum pain during busts. To see if this result could be improved, farrelly's tested a series of portfolios where each portfolio maintained a constant weight to resources and was rebalanced annually. The expectation was that the optimal constant weight would

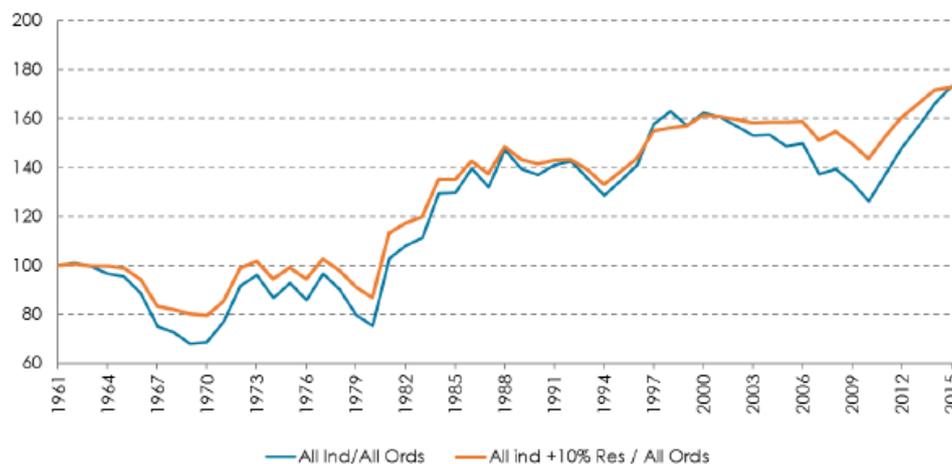
be close to 0% given resources have underperformed industrials by 2.4% per annum on average since 1961.

But something curious happens when testing fixed weight, rebalanced portfolios. The 2.4% per annum drag that comes from introducing resources was recovered by the rebalancing process which buys resource stocks during dips and sells during rebounds – the opposite of the market capitalisation weight index process.

It turns out that an annually rebalanced portfolio of 90% industrials and 10% resources would have given an almost identical return to that of a 100% industrials portfolio – a return that was 1.2% per annum ahead of the All Ordinaries Index.

All this is illustrated in Figure 5. The blue line shows the result of dividing the cumulative performance of the All Industrials index by the cumulative performance of the All Ordinaries Index. The orange line shows the 90/10 industrial/resources returns against the returns of the All Ordinaries Index. Essentially, when the line is going up, the portfolios are outperforming the All Ordinaries and underperforming when the line is going down. Over 55 years the 1.2% per annum translates into a total outperformance of 60%. Note that the rebalanced portfolio with 10% in resources shows far less underperformance during resources booms and still gives similar overall returns to the All Industrials index.

Figure 5: Relative performance of Industrials & 10% Resources mix vs. All Ordinaries



Sources: ASX, Farrelly's analysis.

SETTING A NEUTRAL WEIGHT

Based on the analysis carried out here, a neutral weight to resources stocks of anywhere between 0% and 11% of the Australian equities portfolio would make sense, with the choice largely being up to the investor.

As is so often the case, there is more than one way to skin the cat. A 0% neutral position to resource stocks would suit someone who does not like volatility and who is truly able to sit out a huge boom in resource stocks, without being drawn in due to persistent underperformance.

A better neutral position for most would be to have around 10% of the Australian equities portfolio invested in resources stocks. Historically, at least, this has not detracted from portfolio returns and it does mean that investors will participate meaningfully in any booms that come around from time to time.

Interestingly, the resource stocks share of the FTSE All World Index has ranged from 7% to 14% over the past 15 years with a 10% weight sitting in the middle of that range.

One drawback of setting a 10% neutral weight is the need to ensure that rebalancing actually does take place. This will feel counterintuitive and painful at times. Buying into underperforming markets and selling booming markets is not always easy.

Moving away from neutral weights

Having set a neutral weight, the next thing to do is to decide if, and on what basis, we might move away from that benchmark weight. There are a few considerations here.

Firstly, making reliable predictions about long-term resource stock performance is extremely difficult. For many years, farrelly's has attempted to find a reliable model to forecast returns for this sector. When undertaking such work, a strict procedure is followed. Firstly, before looking at any data, we formulate a hypothesis of how such a forecast might be done, ensuring that the model structure has economic integrity. Then it is time to test the model. If the model doesn't work, we stop there. This is important. If variables are manipulated to see if a better result can be found, you quickly get into the realm of data mining where just about every result should be taken with a grain of salt.

In the case of resources, the first cut of models produced terrible results. So we then broke the golden rule and embarked on a program of rigorous data mining. Again, we could not get any reasonable results. This was a useful discovery. If we can't get a useful model even by cheating, we can be reasonably sure that this sector is nigh on unforecastable on a systematic basis. That means that any forecast for resources stocks carries with it a very high level of uncertainty – much larger than the levels of uncertainty that relate to industrial share forecasts. This doesn't mean that likely outcomes are always unforecastable, but that those times are not the norm. However, as we will see, now appears to be one of those times when we can get a better than usual sense of what performance may lay ahead.

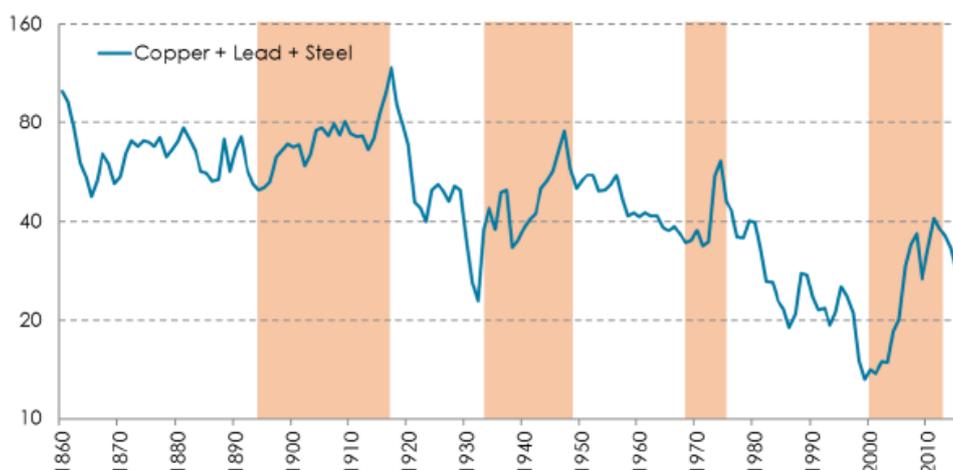
Trying to track the resources boom/bust cycles

As was shown in Figure 4, resources booms and busts are long. They are also variable, with the booms lasting between three and 10 years while busts last between eight to 20 years. With the current bust now six years old, we could be in for as little as another two years before the next boom or as much as another 12 years, if history is anything to go by. And, in terms of timing the ends of these booms, history really isn't much to go by. All history really tells us is that these cycles are long and variable in length.

That resources have a long cycle makes complete sense. Past commodity price booms have tended to occur during times of surging industrialisation or war, with a consequent rapid increase in demand for raw materials. The nature of the mining and oil industry is that the lag between surging demand and supply coming on line can be 10 to 15 years. In the meantime, the shortage of supply over demand means soaring prices cause many previously sub-economic projects to become viable. These projects fill the gap until new projects, inspired by ever increasing prices, come on stream five, 10 or 15 years later. As the saying goes, the best cure for high commodity prices is high commodity prices. Eventually, the world goes into oversupply, prices tumble and marginal players go to the wall until a new equilibrium is reached. Prices drift lower as production becomes more efficient until a new boom is brought on by the next wave of industrialisation.

Figure 6 below shows 150 years of inflation-adjusted base metals prices – a combination of copper, lead and steel. The long boom-bust cycle is clearly apparent.

Figure 6: Real US\$ base metal prices, 1860 – 2016



Source: NBR Paper 18824, US fed Reserve, farrelly's analysis

One of the intriguing aspects of Figure 6 is that until 2000, we could safely say that the long-term trend of real commodity prices was down. Essentially, the argument was that

prices reflect the cost structure of the marginal producers and that, in the long-term, costs fall in real terms as production becomes more efficient. Now we can't be so sure. That prices reflect the cost structure of marginal producers seems to still apply, but the huge increase in demand coming from the industrialisation of China and other emerging markets may mean that demand is likely to stay at current high levels almost indefinitely.

However, just because demand for metals is likely to remain high doesn't mean further price increases lie ahead. Supply has well and truly met current demand. Unless there is another major increase in demand from today's high levels, it is likely that metals prices will resume their slow journey south as existing mines become more and more efficient and as new mines slowly come on stream. While it may take decades for prices to reach previous lows, they seem unlikely to begin another upsurge without a major uplift in demand. Unfortunately, the chance of a such a lift in demand seems small.

The end of emerging markets super growth?

In the recent past, we've raised the possibility that the long running boom in emerging markets may be coming to an end, the reason being that the debt-fuelled growth model may be reaching its limits. Put crudely, the emerging markets model appears to be to borrow money to build factories and infrastructure that transforms low productivity farmers into high productivity factory and construction workers. Given that GDP is simply the number of workers multiplied by the productivity of those workers, supercharging productivity growth through debt results in supercharged GDP growth. Conversely, slow growth in debt will mean slow GDP growth and growth in demand for commodities. The current very high debt levels in emerging markets make it unlikely that debt driven growth can continue.

Most analyses of debt levels in economies focus on the ratio of debt to GDP. We prefer to look at debt servicing costs to GDP and, in particular, corporate debt servicing costs to GDP. This is the minimum share of the economy that corporations must earn just to pay the interest on their debt. Profit comes after that. This is a better measure because it explains why some countries, such as Japan, can operate with very high debt to GDP levels while others struggle with much lower levels. Clearly, having corporate debt at 100% of GDP is much more manageable with interest rates at 2% than with interest rates at 10%. Similarly, while Japan has government debt at around 230% of GDP, the government interest servicing expense is less than that of Australia as a share of GDP.

Figure 7 shows the level of debt at which growth topped out in a range of developed markets, and where debt levels sit in a range of key emerging market economies today.

Figure 7: Corporate debt servicing costs as a share of GDP

Country	Corporate debt/GDP	Corporate interest /GDP
Developed markets		At peak
US	70% ¹	4.6%
Euro area	97% ¹	6.0%
UK	87% ¹	6.0%
Japan	142% ²	9.9%
Emerging markets		Now
China	161%	7.1%
India	51%	5.5%
Brazil	50%	8.9%
South Korea	106%	3.8%

Source: ASX, S&P, farrelly's calculations. Notes. 1. Metals & minerals + Energy. 2. All Ords Ex Resources 3. For dates prior to 1979, returns are based on average monthly indices.

In all cases, the interest burdens are at levels that suggest that further debt-fuelled growth and a resulting surge in demand for commodities is quite unlikely. India is the best hope, but only if it can get its inflation and interest rates much lower than at present. The best we can hope for is for metals prices to stabilise around current levels. Hence, if this forecast is wrong, it is likely to be overly optimistic.

The outlook for energy prices

Energy prices, another important part of the resources puzzle, show quite different long-term characteristics. Unlike their base metal counterparts, real energy prices, having been relatively stable for 100 years, began a volatile upward journey in the 1970s with three major booms along the way.

It has been argued that oil prices have not followed the downward trend of metal prices because most of the easy oil has been found and finding and extracting oil has become an ever increasingly expensive affair. Again, OPEC notwithstanding, prices tend to reflect the cost structures of the marginal producers.

Enter the shale oil revolution which, potentially, has changed everything. For much of the past 50 years, finding a new commercial oil field was an immense, time consuming and costly undertaking. Success was increasingly rare and the concept of peak oil was born – that is, the world was running out of oil. Vast quantities of shale oil were known to exist but the cost of production was always so far in excess of the oil price that it was thought that these deposits were never going to be tapped. However, a combination of breakthroughs in fracking technology and oil prices in excess of US\$100 per barrel made these deposits economically viable and the shale oil boom was born.

The shale oil boom has fundamentally changed the economics of the oil business in two important ways. Firstly, it got projects going. And guess what? The operators started getting better at using the technology. Costs of US\$100 per barrel shrank to US\$80 and then US\$60 per barrel. Oil shale producers now expect to be able to reduce costs down below US\$40 over time. A few years of super-charged oil prices got frackers in the game. Once again, the best cure for high oil prices has proved to be high oil prices.

The second and more significant aspect is that finding and producing oil from shale is not difficult, it does not require huge capital expenditure and, most importantly, it is quick. A project can go from start to finish in four years with the majority of production occurring in the first 18 months of operation. From now on, we can expect that high oil prices, of say, US\$70 per barrel, will trigger an immediate and significant response from oil shale producers. Furthermore, if prices then fall, production will quickly follow suit. It would seem that the days of mainly rising and hugely volatile oil prices may well be behind us.

Going forward, regardless of the state of emerging market economies, it seems that oil prices will be capped at about US\$70 per barrel and are more likely to fluctuate around US\$40 to US\$50 per barrel. If world growth proves to be disappointing, prices may well drift lower.

The impact of commodity prices on resource stocks EPS

With great reluctance, we now head down the path of forecasting resource company earnings using detailed broking forecasts as a template, but replacing their forecasts for commodity prices and the Australian dollar with farrelly’s high, medium and low estimates.

Figure 8: High, medium and low scenarios for resources EPS and PE ratios

Scenario	Iron ore US\$/tonne	Oil US\$/bbl	Gold US\$/oz	A\$/US\$	Average 2018 EPS	Average 2018 PE
Low prices	30	30	900	0.77	308	10.9
Medium prices	50	50	1200	0.72	119	28.1

High prices	70	70	1600	0.62	44	75.8
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Source: Broker reports on the four largest stocks in the Resources index, with farrelly's price and cost assumptions. Note: Together these four stocks make up 62% of the index.

We find that, firstly, earnings forecasts are highly volatile – modest changes in inputs produce substantial changes in estimated earnings.

Secondly, while we need to acknowledge that these forecasts are necessarily imprecise, they certainly don't suggest the sector is cheap. On the contrary, to arrive at a reasonably attractive PE in 2018, commodity prices need to be at the high end of our range.

Regardless of whether we wish to adopt a static weight in resources which is lower than the current weight or whether we wish to time our exposure based on the outlook for the sector, right now would appear to be a good time to reduce weights in resources following a 45% rally since mid January this year.

PUTTING IT ALL INTO PRACTICE

This is all good in theory, but it needs to be practical. So let's assume a 10% neutral weight to resources has been adopted.

Small investors

For these investors, farrelly's suggests one of two approaches. Probably the easiest is to find a fund manager with a long-term structural bias against resources. Subscribers' fund research houses will know which managers they are. This has the advantage that, from time to time, where that manager gets the timing right, they will see opportunities in the sector and increase the level of investment. This will all occur without requiring your intervention.

Alternately, find an Australian equities manager that has an industrials-only mandate and pair them with a manager with a resources-only mandate. Rebalance every few years. International resource mandates and ETFs are all valid ways of gaining this exposure. Again, fund research houses will help identify the right fund managers.

Larger clients without direct equities

Either of the above approaches could work for larger clients without direct equities exposures, using an increased number of fund managers if that suits. For larger investors, rebalancing should occur regularly but not more than annually.

For these investors, the consideration as to whether to try and time the cycle comes into play. This is fiendishly difficult. Farrelly's suggestion would be to ensure that you have a very clearly articulated strategy with little or no room for subjective calls. Attempts to determine valuations and where we are in the cycle will always be quite imprecise. Overlaying that imprecision with a woolly strategy is just asking for trouble. If all of this is too hard, then a permanent strategy of no resources exposure is also quite reasonable.

Direct equity investors

With direct equity investment, this all becomes straightforward from an execution perspective. The analytical piece remains just as challenging. The only advice we would offer is that, if there is any risk that we are in the bust stage of the resources cycle, stick to the lowest cost producers. They will at least still be around when all is said and done. Now is such a time.

TIME TO REVIEW YOUR RESOURCES EXPOSURE

The Australian sharemarket's high weight to resource stocks is an accident of history and geography. When looked at from either a volatility perspective, an historic return perspective or an international perspective, a 10% neutral weight seems much more sensible than market capitalisation weights.

Because of the long-term and extreme nature of commodity booms and busts, a 90%/10% industrial/resource portfolio will deliver lower volatility than an All Ordinaries Index-aware portfolio but will go through long periods of under- and over-performance along the way.

The ability to predict these boom and bust cycles would be immensely valuable. Not surprisingly, such predictions are not easy. Valuation-based approaches are also unreliable. The forecasts Farrelly's produces for resources come with a very large level of uncertainty. However, notwithstanding that low confidence level, it does appear that the current bust is unlikely to reverse any time soon and that resource stocks do appear more likely to produce poor returns than attractive returns over the next decade.

Finally, reducing resources weights will make the Australian equity portfolio performance more predictable and, consequently, the overall asset allocation task easier.



Tim Farrelly is principal of specialist asset allocation research house, [Farrelly's Investment Strategy](#), available exclusively through PortfolioConstruction Forum. Tim is a member of [PortfolioConstruction Forum's core faculty of leading investment professionals](#).
