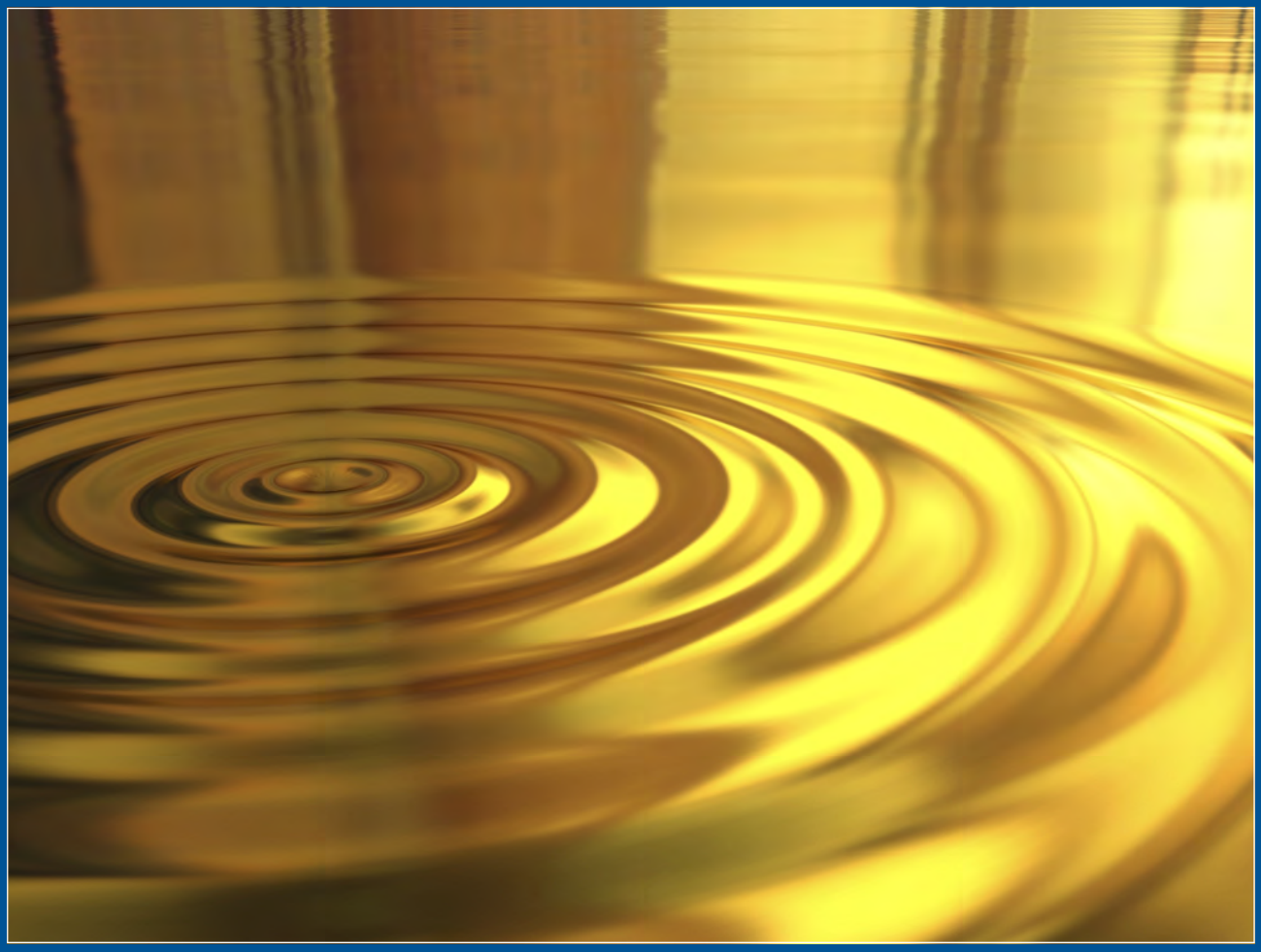
Gold

New benchmarks for old

Sector report, November 2012



Published by Edison Investment Research

New benchmarks for old

The world turned upside down

"Of all the contrivances for cheating the laboring classes of mankind, none has been more effective than that which deludes them with paper money."

A former US Secretary of State under three Presidents, Daniel Webster was generally regarded as having made “the most eloquent speech ever delivered in Congress.” As a director of the Boston branch of the Second Bank of the United States, he also knew the value of fiat money. After his death he was pilloried by historian, Henry Lodge, for the perpetual debt against which he employed "checks or notes for several thousand dollars in token of admiration" from his friends. Ironic perhaps that 160 years after his death, a personal lifestyle appears to be becoming a public policy.

Long-term gold price US$1,676/oz; short-term upside

In this report, Edison has developed the theory that it first propounded in April 2009 to predict the long-term price of gold with respect to the total US monetary base. With QE3 underway, we now estimate that the long-term price of gold should be US$1,676/oz, with the potential to reach US$2,649/oz in the short term. Finally, we observe that the gold price would have to rise to US$9,904/oz if America’s official stock of gold were required to give full backing to its US$2.6trn total monetary base (something it did as recently as 1980) and that it would have to rise to US$16,942/oz if it were required to cover the US’s net external deficit (excluding gold) of US$4.4trn – something that could become more relevant with the change of leadership in China this month.

Average value of gold in the ground: US$108/oz

In addition to its value out of the ground, Edison has also calculated an average value of gold in the ground of US$108/oz (vs US$159/oz in January 2010). However, there have been large changes since our last report. The values of Canadian, Australian and London-listed ‘inferred’ ounces have all fallen by more than 90%, for example. There are also large disparities depending on the ownership of an ounce of gold. Where we find that, on average, a ‘measured’ ounce is worth US$488/oz to a producer, for example, it is worth US$98/oz to an explorer. In this report, not only do we detail the different values for ounces by ownership, function and listing, but we also quantify the correct discount rates to be applied to companies at different stages of development, as well as valuing a notional company and demonstrating the limitations of the capital asset pricing model (CAPM), as conventionally applied, to developing gold producers.

19 November 2012

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Companies in this report

Canadian (59)	1,158Moz
UK (39)	179Moz
Australian (27)	335Moz

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Contents

Investment summary: Insights from building a 'perfect' gold company and views on the long-term gold price

In previous reports, Edison has used companies with different resource bases to derive values for 'measured', 'indicated' and 'inferred' ounces (NB a more detailed explanation of this methodology is included in the appendices on page 57).

In part I of this report, Edison extends and updates the work done in its earlier studies to derive average values for 'measured', 'indicated' and 'inferred' ounces in three different centres of mining finance (London, Canada and Australia). Note that, in this particular case, Witwatersrand ounces were specifically excluded from the analysis owing to their unique nature and valuations and will be the subject of a subsequent report.

A list of the companies analysed in this report can be found in the appendices.

In January 2010, Edison analysed 132 discrete companies in its report, *Gold – Valuation benchmarks are obsolete*. Since then, 13 companies have been acquired and four more have sold their principal asset, while two are involved in legal disputes with the governments of the countries in which they operate regarding the details of their rights to operate. Edison has endeavoured to maintain the size of its sample by including 21 new companies in its analysis. Note that Edison's overall approach to this analysis has been to try to maximise the sample size, albeit within the limitations of its resources. As such, no company has been subjectively excluded from the analysis compared to January 2010, except on the basis of owning assets in the Witwatersrand basin. A summary of the ounces reviewed by Edison is as follows:

Exhibit 1: Summary of resource ounces analysed in order to determine resource category valuations, by market listing

	Measured (Moz)	Indicated (Moz)	Inferred (Moz)	Total (Moz)	%
London market					
Inferred only	0.0	0.0	1.1	1.1	
Indicated and inferred	0.0	11.2	13.4	24.6	
Measured, indicated and inferred	21.7	88.4	43.4	153.5	
Total	**21.7**	**99.7**	**57.9**	**179.3**	**10.7**
%	12.1	55.6	32.3	100.0	
Canadian market					
Inferred only	0.0	0.0	4.5	4.5	
Indicated and inferred	0.0	8.4	10.6	19.0	
Measured, indicated and inferred	240.6	662.3	231.8	1,134.7	
Total	**240.6**	**670.7**	**246.8**	**1,158.2**	**69.2**
%	20.8	57.9	21.3	100.0	
Australian market					
Inferred only	0.0	0.0	0.4	0.4	
Indicated and inferred	0.0	5.3	13.5	18.8	
Measured, indicated and inferred	43.8	229.3	42.8	315.9	
Total	**43.8**	**234.7**	**56.7**	**335.1**	**20.0**
%	13.1	70.0	16.9	100.0	
Total					
Inferred only	-	-	6.0	6.0	
Indicated and inferred	-	24.9	37.5	62.4	
Measured, indicated and inferred	306.2	980.1	318.0	1,604.2	
Total	**306.2**	**1,005.0**	**361.5**	**1,672.6**	**100.0**
%	**18.3**	**60.0**	**21.6**	**100.0**	

Source: Edison Investment Research

A summary of the initial results of the analysis, which are discussed in more detail on pages 21-22, are shown in the table below. Of interest is the fact that all valuations, barring London 'indicated' and (possibly) Canadian 'measured' ounces (see proviso on page 15), have fallen in value. Note that over the same timeframe, the gold price rose by approximately 45%, from US$1,118/oz in January 2010 to US$1,626/oz.

Exhibit 2: Global gold sector valuation with respect to resource category summary, by market and versus January 2010

	August 2012			January 2010			Variance (%)		
	Measured	Indicated	Inferred	Measured	Indicated	Inferred	Measured	Indicated	Inferred
London market	198.23	134.36	(5.04)	403.53	85.94	3.78	(50.9)	56.3	(233.3)
Canadian market	429.43	53.57	3.84	283.68	243.76	62.01	51.4	(78.0)	(93.8)
Australian market	505.68	40.71	8.33	738.55	143.43	91.47	(31.5)	(71.6)	(90.9)
Arithmetic mean	**377.78**	**76.21**	**2.38**	**475.25**	**157.71**	**52.42**	**(20.5)**	**(51.7)**	**(95.5)**

Source: Edison Investment Research. Note: Excludes Witwatersrand basin ounces.

The analysis demonstrates a marked convergence in the valuations in all three categories of resource ounces across the three markets since the publication of *Gold – Valuation benchmarks are obsolete* in January 2010. In a further refinement, we then calculate the average values for ounces owned by explorers, compared to ounces owned by producers (below):

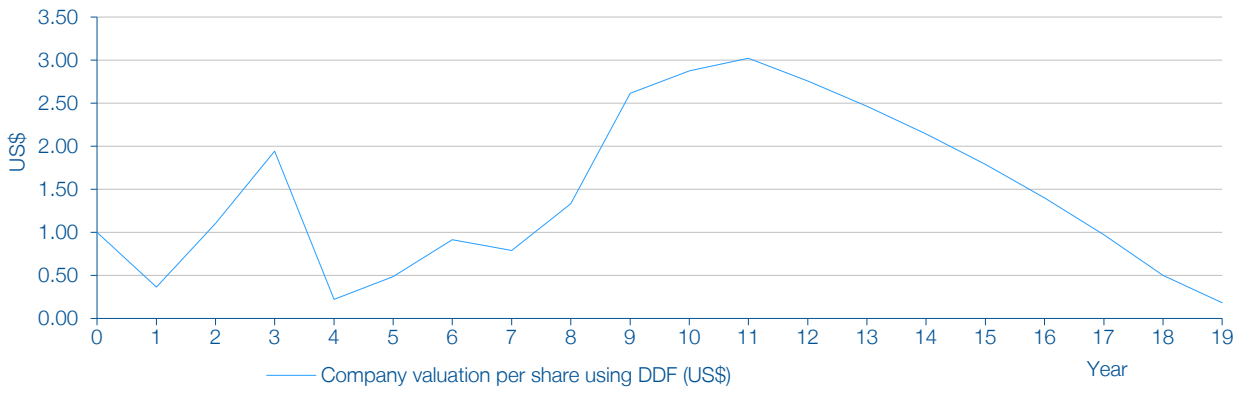
Exhibit 3: Global gold sector valuation with respect to resource category, by company function

	Producers			Explorers			Total		
	Measured	Indicated	Inferred	Measured	Indicated	Inferred	Measured	Indicated	Inferred
London market	227.92*	765.62	(5.04)	94.54	50.21	(5.04)	198.23	134.36	(5.04)
Canadian market	506.79	56.26	3.84	(37.06)	52.63	3.84	429.43	53.57	3.84
Australian market	727.97	9.44	8.33	236.33	83.52	8.33	505.68	40.71	8.33
Arithmetic mean	**487.56**	**277.11**	**2.38**	**97.94**	**62.12**	**2.38**	**377.78**	**76.21**	**2.38**

Source: Edison Investment Research. Note: Excludes Witwatersrand basin ounces. Note: *With 'indicated' valued at US$134.36/oz.

Later, Edison uses its universe of c 60 stocks under full coverage to calculate the risk-adjusted discount rates that should be applied to companies at different stages of development (eg scoping study, pre-feasibility study etc). We then combine these with average costs of discovery (as calculated in association with BDO in our last report, *Gold – Valuation benchmarks are obsolete*, to create and value a hypothetical gold mining company at each stage of its development, from first capital raising to treating terminal stockpiles and unwinding working capital at the end of the life of operations. We then calculate the share price of this company (called NonSuch Gold Ltd and deemed to be listed in London. NB Listings in Australia and Canada are considered separately), assuming three rounds of funding in years 0, 4 and 7 (below).

Exhibit 4: NonSuch Gold Ltd share price (US$)



Source: Edison Investment Research

Four general conclusions may be drawn from this analysis:

- The best overall returns to investors in gold mining companies occur as they negotiate the transition from explorer to developer between years 4 and 9 (above), as expected.
- Nevertheless, comparable overall returns may be made during the resource delineation phase of a company's existence (years 1 to 3), but within a potentially shorter period of time (ie annual returns may be higher).
- The third best returns occur at the end of the life of the mine when working capital is unwound (in the case of a miner, typically low-grade stockpiles are processed at near-zero cost) and terminal value is realised in the form of terminal cash (in addition to the residual 'inferred' resource).
- Three points of value destruction exist – the initial conversion of cash into an 'inferred' resource in Year 1 (although note this would not be the case for an Australian-listed company), the shift from a resource to a scoping study in Year 4 and the final, major round of equity fund-raising (in this case) in Year 7.

We then expand on the analysis performed on NonSuch Gold Ltd to demonstrate that the capital asset pricing model (CAPM) as conventionally applied to equities does not adequately price the cost of equity for companies seeking to negotiate the transition from explorer to producer and that the various risks associated with this transition are not typically reflected in individual companies' betas (ie their stock price volatilities).

Based on a study of actual returns from companies seeking to negotiate this transition (which, in the event of success, are broadly in line with the returns predicted from the analysis of NonSuch Gold Ltd), we conclude that the most efficient asset allocation for a portfolio of mining companies negotiating the transition between explorer and producer will depend on an investor's attitude to risk, as follows:

- On the basis of past returns, those investors looking to outperform the gold price will need to construct a highly concentrated portfolio of 'explorer to producer' stocks, eg one or two stocks out of a choice of 10. This strategy might be described as 'picking winners'.
- Those investors looking to outperform generic US on-the-run government bill/note/bond indices will need to construct a portfolio that is two or three times more diversified, eg two or three stocks out of a choice of 10.
- Those investors looking to outperform the FTSE All-Share Mining index should construct a portfolio of three stocks (out of 10).
- Specialist investors looking to maximise their risk-adjusted returns within the portfolio, without reference to a risk-free asset, should construct a fully diversified portfolio of companies. This strategy might be described as 'diluting losers'.

Finally, in Part II of this report, we perform an analysis on the gold price with respect to the size of the US monetary base. Over the past 53 years, the Pearson Product Moment Coefficient between the two is 0.903 – statistically significant at the 5% level (that is to say, there is less than a 5% probability that this relationship occurred by chance). Such an analysis becomes particularly significant at a time when the US monetary base is increasing, as it is now. To date, the Federal Reserve's QE and QE2 initiatives have increased the total US monetary base by over 200% since 2007, while the gold price has increased from US$697/oz to approximately US$1,730/oz currently. Assuming it will increase by US$40bn per month as a result of QE3 in broadly the same way as it did for QE1 and QE2, the total US monetary base will expand from US$2.6trn (as at end-September) to US$2.8trn by December and US$3.3trn by December 2013 etc. Given the historical relationship between the two, this implies a long-term gold price of US$1,446/oz as at December 2012, US$1,676/oz as at December 2013 and, if QE3 then continues, US$1,906/oz as at December 2014 and US$2,136/oz as at December 2015. In the past however (and particularly during gold bull market periods), we note that the price has traded at a premium to this level of up to 83%, suggesting that a price of US$2,649/oz is achievable in the short term

Part I

Gold – the value of ounces in the ground

The London market

In our consideration of the London market, we have analysed 39 companies, compared to 41 in our report of January 2010. Exhibit 5 lists the changes.

Exhibit 5: Summary of companies included and excluded in London analysis compared to January 2010 analysis

Companies included since January 2010	Companies excluded since 2010
Ovoca	China Goldmines (sold asset)
Triple Plate Junction	Wits Gold (Wits assets excluded)
Caledonia	Central Rand Gold (Wits assets excluded)
Mariana	Tianshan Goldfields (asset sold)
Nyota	Central African Gold (acquired by New Dawn)
Bullabulling	Greystar Resources (mining title and boundary dispute)
Hummingbird	European Goldfields (acquired)
Minera IRL	Oxus Gold (legal dispute with Uzbek government re asset)
African Barrick Gold	Allied Gold (acquired by St Barbara)
	Medoro Resources (taken over/merged with Gran Colombia)
	GMA Resources (asset sold; cash shell)

Source: Edison Investment Research

A summary of the updated results by resource category sub-sector is given in the table below.

Exhibit 6: London gold sector summary valuation with respect to resource category

Resource categorisation	Inferred	Indicated and inferred	Measured, indicated and inferred	Total
October 2012 analysis				
Number of companies	**3**	**12**	**24**	**39**
%	**8**	**31**	**61**	
Market cap (US$m)	**24**	**1,636**	**16,500**	**18,159**
%	**0**	**9**	**91**	
Net cash (US$m)	**30**	**193**	**534**	**757**
%	**4**	**25**	**71**	
EV (US$m)	**(6)**	**1,443**	**15,965**	**17,402**
%	**0**	**8**	**92**	
Total oz (m)	**1.1**	**24.6**	**153.6**	**179.3**
%	**0**	**14**	**86**	
Market cap/total oz (US$)	**20.98**	**66.51**	**107.44**	**101.27**
EV/total oz (US$)	**(5.04)**	**58.64**	**103.96**	**97.05**
January 2010 analysis				
Number of companies	3	7	31	41
%	7	17	76	
Market cap (US$m)	22	927	17,642	18,591
%	0	5	95	
Net cash (US$m)	11	75	149	235
%	5	32	63	
EV (US$m)	10	852	17,493	18,356
%	0	5	95	
Total oz (m)	2.7	191.2	133.4	327.3
%	1	58	41	
Market cap/oz (US$)	7.96	4.85	132.2	56.80
EV/oz (US$)	3.78	4.46	131.12	56.08

Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012.

We deal with the more detailed aspects of the analysis in each of the following sections relating to the specific categorisation of the ounces concerned. However, headline observations relating to the changes apparent in the sector over the course of the last (almost) three years may be summarised as follows:

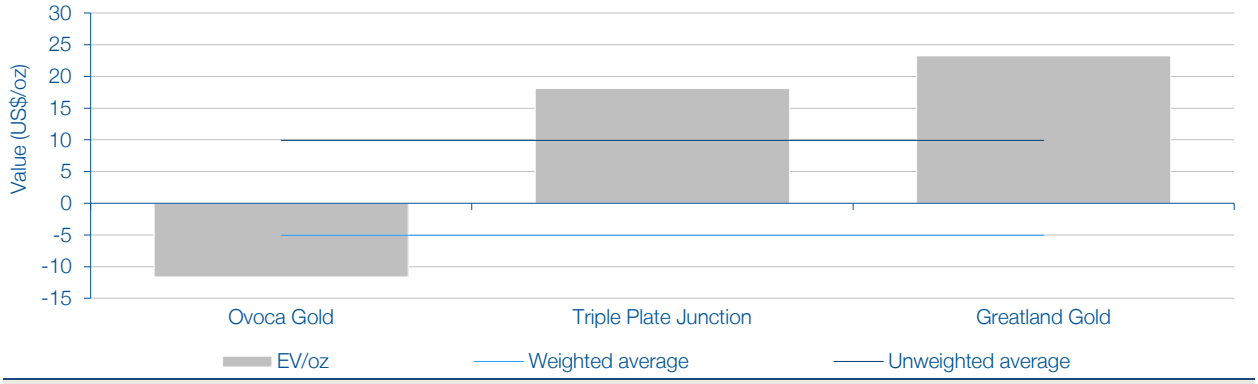
- The market capitalisation of the sector is, perhaps surprisingly, largely unchanged compared to January 2010, although some of the change may be accounted for by the loss of relatively low market cap companies and the inclusion of relatively high ones (eg African Barrick Gold). See Exhibit 5, above.
- Net cash in the sector has risen sharply and across all categories of resource ounces.
- The number of ounces in the 'indicated and inferred' category has fallen sharply, although this is primarily as a result of the explicit exclusion of Witwatersrand ounces from the analysis.

The value of inferred ounces in London

Within the London market, the derivation of the average value of 'inferred' ounces is the analysis most affected by changes in the companies involved, with two out of three companies analysed in our report of January 2010 having changed. China Goldmines and Condor have been excluded from the sample group (the former after it sold its asset and the latter because it has promoted 'inferred' ounces to 'indicated' ounces and has therefore been included in the 'indicated and inferred' sample instead). Ovoca and Triple Plate Junction have been included in their place, the former having delineated a gold resource since Edison's last report (after having sold its lead, silver asset) and the latter having now delineated a maiden 'inferred' resource. Note that the sample size used in calculating the average value of 'inferred' ounces is necessarily limited by the identification of companies with such a resource profile.

A summary of the per ounce valuations of the three companies with 'inferred' ounces only is given in Exhibit 7, below.

Exhibit 7: Implied value of 'inferred' ounces in the London market (US$), by company and averages



Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012; producers in blue, explorers in grey.

The weighted average value of minus US$5.04/oz compares with a value of US$22.39/oz in October 2010, US$3.78/oz in January 2010, minus US$1.31/oz in October 2009 and US$1.05/oz in April 2009. A summary of this progression is given in Exhibit 8, below.

Exhibit 8: Evolution of the value of London-listed 'inferred' gold ounces with respect to the gold price, 2009 to present

	April 2009	October 2009	January 2010	October 2010	August 2012
Average gold price (US$/oz)	890	1,043	1,118	1,342	1,626
London-listed 'inferred' gold oz valuation	1.05	(1.31)	3.78	22.39	(5.04)

Source: Edison Investment Research, Kitco

The weighted average market capitalisation per ounce of the three companies is US$20.98. This may be interpreted as the value of each ounce in the event that each company exhausts its cash, but fails to enlarge (or upgrade) its resource – a relatively unlikely contingency, but this scenario may nevertheless be used to give an indication of the upper limit of the valuation of these ounces in London.

The value of an 'indicated' ounce in London

A summary of those companies with 'indicated' and 'inferred' ounces only is given in the table below.

Exhibit 9: Sub-sector summary of companies with 'indicated' and 'inferred' resource ounces only (London market)

Resource category	Number of companies	Market cap (US$m)	Net cash (US$m)	EV (US$m)	Measured	Indicated	Inferred	Total oz (m)	EV per total oz (US$)
October 2012									
Indicated and inferred	12	1,636	193	1,443	0.0	11.2	13.4	24.6	58.64
January 2010	7	927	75	852	0.0	43.5	147.9	191.2	4.46
Jan 2010 (excluding Wits oz)	5	680	3	678	0.0	7.5	7.7	15.1	44.97

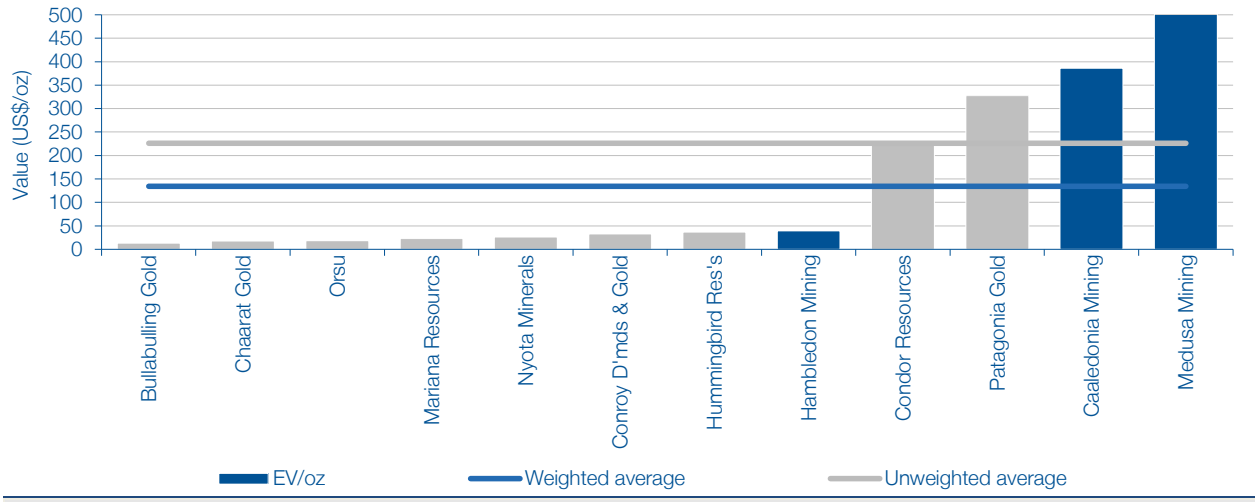
Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012

As can be seen from the data above, the effect of the exclusion of Witwatersrand ounces in the October 2012 analysis, compared to the January 2010 analysis, is immediately apparent.

Despite the Wits effect, of note is the increase in the size of the sample group (with Caledonia, Mariana, Nyota, Bullabulling and Hummingbird included for the first time and Wits Gold and Central Rand Gold excluded) and the increase in its market cap (+141%), net cash, EV and total resource (+63%).

Having established the value of an 'inferred' ounce, it is then possible to derive the average value of an 'indicated' ounce by considering those companies with 'indicated and inferred' ounces only and netting off the implied value of the 'inferred' ounces (at the average valuation) from their enterprise values. Using this approach for the 12 companies with 'indicated and inferred' ounces only derives a weighted average value for each 'indicated' ounce of US$134.36, versus a comparable (non-Wits) figure of US$85.94/oz in January 2010. A graph of the actual implied values for 'indicated' ounces for each of the companies in this sub-category is as follows:

Exhibit 10: Implied value per 'indicated' resource ounce, London market (US$)



Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012; producers in blue, explorers in grey.

All but three of the 12 companies represented are explorers (Medusa, Caledonia and Hambledon are producers). The implied valuations of all the companies in this category fall within one standard deviation of the mean, with the exception of Medusa, which (as a producer) may be regarded as an example of the sort of valuation that companies with only 'indicated and inferred' ounces may nevertheless achieve, if they are able to develop those ounces profitably and to the satisfaction of the market.

Exhibit 11: Evolution of the value of London-listed 'indicated' gold ounces with respect to the gold price, 2010 to present

	January 2010	October 2010	August 2012
Average gold price (US$/oz)	1,118	1,342	1,626
London-listed 'indicated' gold oz valuation	85.94	129.32	134.36

Source: Edison Investment Research, Kitco

The value of a 'measured' ounce in London

Eight companies have been removed from the sub-sector analysis to derive a value for 'measured' ounces compared to that in January 2010 (Tianshan Goldfields, Central African Gold, Greystar Resources, European Goldfields, Oxus Gold, Allied Gold, Medoro Resources and GMA Resources). Two have been added, namely Minera IRL and African Barrick Gold (the latter having been listed separately in London in March 2010). A summary of those companies with 'measured, indicated and inferred' ounces is given in the table below.

Exhibit 12: Sub-sector summary of companies with 'measured, indicated and inferred' resource ounces (London market)

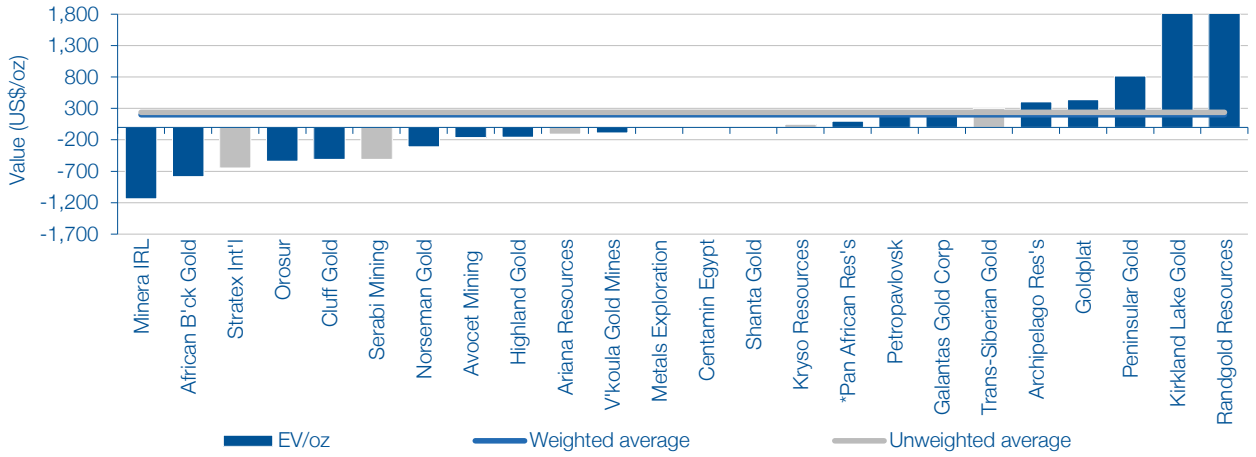
Resource category	Number of comapnies	Market cap (US$m)	Net cash (US$m)	EV (US$m)	Measured	Indicated	Inferred	Total oz (m)	EV per total oz (US$)
October 2012									
Measured, indicated and inferred	**24**	**16,500**	**534**	**15,965**	**21.7**	**88.4**	**43.4**	**153.6**	**103.96**
January 2010	31	17,642	149	17,493	31.2	56.1	46.2	128.0	133.41

Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012

Of note within this sub-sector is the increase in net cash and 'indicated' ounces (principally accounted for by the inclusion of African Barrick in the sample) and the decline in 'measured' and 'inferred' ounces.

Exhibit 13 illustrates the implied valuations for 'measured' ounces in the sub-sector, by company.

Exhibit 13: Implied value per 'measured' resource ounce, London market, by company (US$)



Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: *Considered before acquisition of Evander. Prices as at August 2012; producers in blue, explorers in grey.

The weighted average value of a 'measured' resource ounce listed in the London market, on this basis, is US$198.23.

Of note is the perceived 'regularisation' of the graph of the London-listed companies with 'measured' ounces, in that it now much more closely resembles the equivalent, historical graphs for Australian and Canadian-listed companies (see our report *Gold – Valuation benchmarks are obsolete*) published in January 2010.

A table of the evolution of the valuation of London-listed 'measured' ounces with respect to the gold price is shown in the table below.

Exhibit 14: Evolution of the value of London-listed 'measured' gold ounces with respect to gold price, 2010 to present

	January 2010	October 2010	August 2012
Average gold price (US$/oz)	1,118	1,342	1,626
London-listed 'measured' gold oz valuation	403.53	365.72	198.23

Source: Edison Investment Research, Kitco

The Canadian market

In our consideration of the Canadian market, we have analysed 59 companies compared to the same number of companies in our report of January 2010. A list of the changes is as follows (although it should be noted that many of the companies excluded were as a result of takeovers by companies that continue to be included in the analysis, ie the resources continue to be included, albeit within another corporate vehicle, even if the companies are not).

Exhibit 15: Summary of companies included and excluded in Canadian analysis compared to January 2010

Companies included since January 2010	Companies excluded since 2010
International Minerals	Fronteer (acquired by Newmont)
Moneta Porcupine Mines	Cystallex International (temporary cease trade order/DIP* financing)
Klondex Mines	Northgate Minerals (taken over by AuRico)
Brigus (merger of Linear Gold and Apollo Gold)	European Goldfields (acquired by Eldorado)
Kermode Resources	Rare Element Resources (reclassified as rare earth company not gold)
PC Gold	Linear Gold and Apollo Gold (merged to form Brigus Gold)
Coral Gold Resources	

Source: Edison Investment Research. Note: *DIP = debtor in possession.

Taking these changes into account, a summary of the updated results by resource category sub-sector is given in the table below.

Exhibit 16: Canadian gold sector summary valuation with respect to resource category

Resource categorisation	Inferred	Indicated and inferred	Measured, indicated and inferred	Total
October 2012 analysis				
Number of companies	**3**	**6**	**50**	**59**
%	**5**	**10**	**85**	
Market cap (US$m)	**28**	**563**	**126,252**	**126,843**
%	**0**	**0**	**100**	
Net cash (US$m)	**11**	**72**	**(8,349)**	**(8,266)**
%	**0**	**0**	**(100)**	
EV (US$m)	**17**	**491**	**134,601**	**135,109**
%	**0**	**0**	**100**	
Total oz (m)	**4.5**	**19.0**	**1,134.7**	**1,158.1**
%	**0**	**2**	**98**	
Market cap/total oz (US$)	**6.24**	**29.68**	**111.27**	**109.52**
EV/total oz (US$)	**3.84**	**25.88**	**118.62**	**116.66**
January 2010 analysis				
Number of companies	3	6	50	59
%	5	10	85	
Market cap (US$m)	140.7	2,543.7	139,553.9	142,238.3
%	0	2	98	
Net cash (US$m)	0.0	120.3	(3,156.5)	(3,036.2)
%	0	4	(104)	
EV (US$m)	140.7	2,423.5	142,710.4	145,274.5
%	0	2	98	
Total oz (m)	2.3	15.0	720.5	737.8
%	0	2	98	
EV/oz (US$)	62.01	161.25	198.07	196.90

Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012.

Headline observations at this stage are as follows:

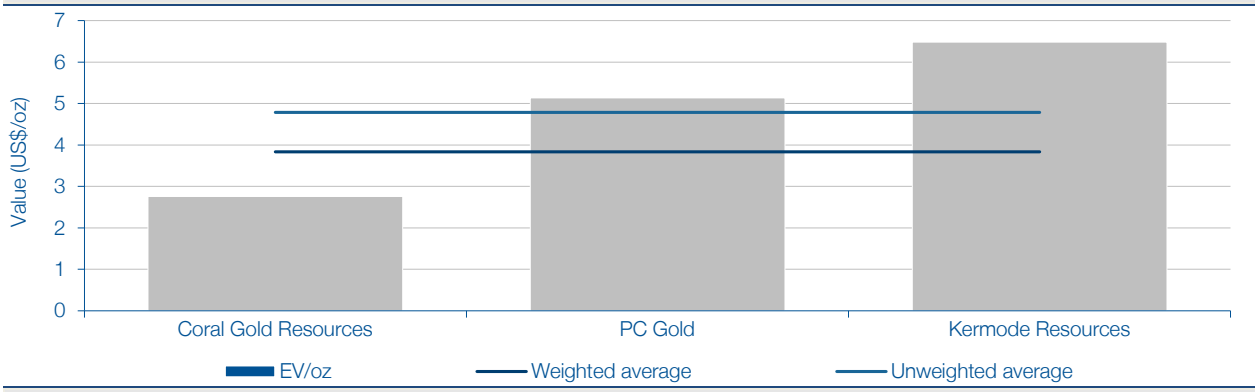
- The collapse in values of the sub-sectors with either 'inferred' or 'indicated and inferred' ounces only.
- The aggregate increase in debt across the industry as a whole.
- The increase in resources in all three sub-categories.

The value of inferred ounces in Canada

Like the London market, the derivation of the average value of 'inferred' ounces in Canada is the analysis most affected by changes in the sample group, with all three companies in the January 2010 analysis having been replaced (Goldrush Resources and Northern Freegold promoted a portion of their resources into the 'measured' and 'indicated' categories respectively, while Rare Element Resources has been reclassified as a predominantly rare earth company and not a gold company).

A summary of the per ounce valuations of the three companies replacing them with 'inferred' ounces only is given in Exhibit 17.

Exhibit 17: Implied value of 'inferred' ounces in Canada (US$), by company and averages



Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012; producers in blue, explorers in grey.

Several features of the analysis are noteworthy:

- The weighted average value of US$3.84/oz compares with a value of US$62.01/oz in January 2010 and a value of minus US$5.04/oz in London (as at August 2012). A summary of this progression is given below.

Exhibit 18: Evolution of the value of Canadian-listed 'inferred' gold ounces with respect to gold price, 2010 to present

	January 2010	August 2012
Average gold price (US$/oz)	1,118	1,626
Canadian-listed 'inferred' gold oz valuation	62.01	3.84

Source: Edison Investment Research, Kitco

- The weighted average market capitalisation per ounce of the three companies is US$6.24/oz (versus US$20.98/oz for the London market), reflecting, among other things, the fact that Canadian-listed companies in the sub-sector have less aggregate cash on their balance sheets and more aggregate ounces in the ground.

The value of an 'indicated' ounce in Canada

An aggregate summary of those companies with 'indicated' and 'inferred' ounces only is given in the table below.

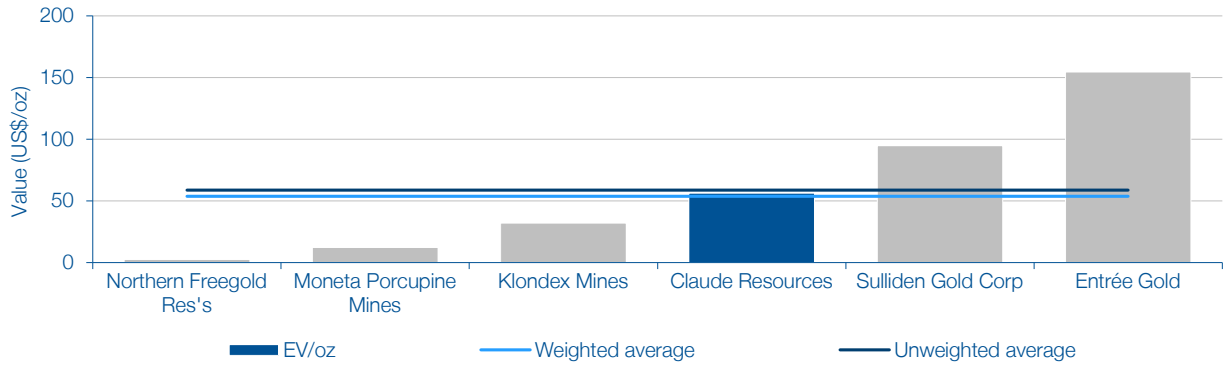
Exhibit 19: Sub-sector summary of Canadian-listed companies with 'indicated' and 'inferred' resource ounces only

Resource category	Number of companies	Market cap (US$m)	Net cash (US$m)	EV (US$m)	Measured	Indicated	Inferred	Total oz (m)	EV per total oz (US$)
October 2012									
Indicated and inferred	6	563	72	491	0.0	8.4	10.6	19.0	25.88
January 2010	6	2,544	120	2,424	0.0	6.8	8.2	15.0	161.25
January 2010 (excluding Lake Shore Gold)	5								105.74

Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012.

Relative to the London market, the Canadian sub-sector with 'indicated and inferred' ounces only also experienced significant change in the three years under review, with VG Gold, Keegan Resources, Guyana Gold and Lake Shore Gold all promoting resources into the 'measured' category. Note that the promotion of Lake Shore Gold from this sub-category had a particularly significant effect, given its then market capitalisation of c US$1.6bn (now US$0.4bn). Interestingly, of the remaining two, both Entrée Gold and Sulliden Gold have valuations comparable to those in January 2010. However, the new entrants to the sector (eg Northern Free Gold promoted from the 'inferred' only sub-category) have all come in at lower implied valuations, as shown below.

Exhibit 20: Implied value per 'indicated' resource ounce, Canadian market (US$)



Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012; producers in blue, explorers in grey.

On the basis of the above sample, the weighted average value of an 'indicated' ounce listed in Canada is US$53.57 (versus US$134.36/oz in London). The unweighted average is US$58.61/oz.

All but one (Claude Resources) of the six companies considered are explorers. The implied valuations of all the companies within this category fall within one standard deviation of the mean, with the exception of Entrée Gold.

Exhibit 21: Evolution of the value of a Canadian-listed 'indicated' gold ounce with respect to gold price, 2010 to present

	January 2010	August 2012
Average gold price (US$/oz)	1,118	1,626
Canadian-listed 'indicated' gold oz valuation	243.76	53.57
Canadian-listed 'indicated' gold oz valuation (excluding Lake Shore Gold)	549.09	53.57

Source: Edison Investment Research, Kitco

The value of a 'measured' ounce in Canada

With the exception of Crystallex International and Claude Resources, the sample size of the Canadian-listed companies with 'measured, indicated and inferred' ounces is largely unchanged compared with three years ago:

Exhibit 22: Sub-sector summary of companies with 'measured, indicated and inferred' resource ounces (Canadian mkt)

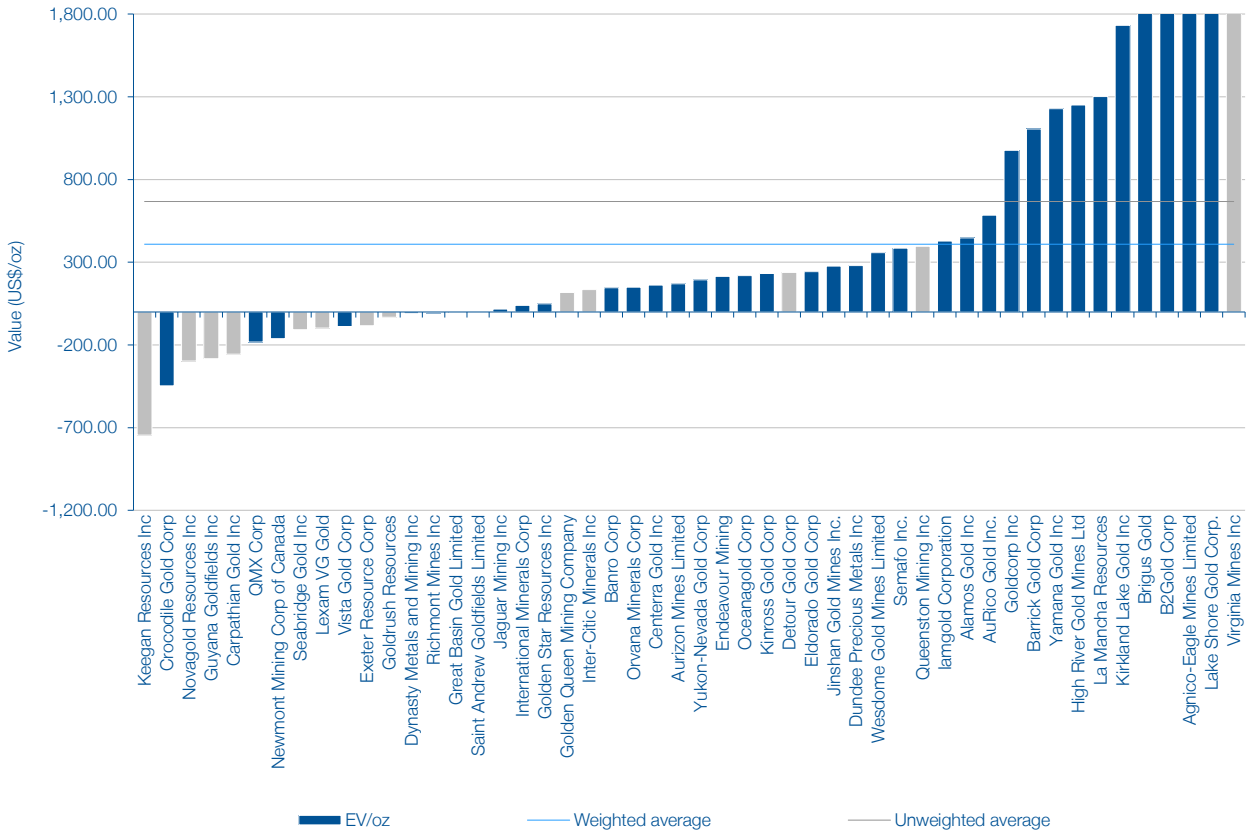
Resource category	Number of companies	Market cap (US$m)	Net cash (US$m)	EV (US$m)	Measured	Indicated	Inferred	Total oz (m)	EV per total oz (US$)
October 2012									
Measured, indicated and inferred	50	126,250	(8,349)	134,601	240.6	662.3	231.8	1,134.7	118.62
Measured, indicated and inferred (excl Wits oz)	49	152,958	(8,106)	134,064	228.8	652.9	220.7	1,102.3	121.62
January 2010	50	139,554	(3,157)	142,710	171.6	330.0	218.8	737.8	198.07

Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012

Of note is the relatively small decline in both market capitalisation and enterprise value within this sub-sector, but a relatively large (54%) increase in total resources.

Exhibit 23 illustrates the implied valuations for 'measured' ounces in the sub-sector, by company.

Exhibit 23: Implied value per 'measured' resource ounce, Canadian, by company (US$)



Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012; producers in blue, explorers in grey.

On this basis, the weighted average value of a 'measured' resource ounce, listed in the Canadian market is US$408.23 (versus US$198.23/oz in London) or US$429.43/oz excluding Witwatersrand ounces.

A table of the evolution of the valuation of Canadian-listed 'measured' ounces with respect to the gold price is as follows:

Exhibit 24: Evolution of the value of Canadian-listed 'measured' gold ounces versus the gold price, 2010 to present

	January 2010	August 2012
Average gold price (US$/oz)	1,118	1,626
Canadian-listed 'measured' gold oz valuation	283.68	408.23
Canadian-listed 'measured' gold oz valuation (excl Wits oz)	312.19	429.43
Canadian-listed 'measured' gold oz valuation (excl Lake Shore Gold in 'indicated' sub-sector)	549.09	408.23

Source: Edison Investment Research, Kitco

Two observations relating to the valuation of Canadian-listed 'measured' ounces are noteworthy in this respect:

- The effect on the sample of the inclusion of Witwatersrand ounces is much less than in other markets. Partly this is because of the size of the sample as a whole. However, it is also apparent that companies with Wits assets are not necessarily accorded anomalous valuations with respect to the rest of the market.
- Since Lake Shore Gold has been promoted from the sample group with 'indicated and inferred' ounces only in January 2010 to the sample with 'measured, indicated and inferred' ounces in August 2012, it has necessarily been excluded from the former group, in which it had been identified as a statistical outlier. Rather than the headline 43.9% increase in the value of a Canadian 'measured' ounce therefore, a better representation of the evolution of value within this particular category is probably a 25.7% decline, from US$549.09/oz to US$408.23/oz, reflecting the de-rating of the sub-sector relative to in-situ ounces generally (see Exhibit 22). Self-evidently, this is a matter of opinion and interpretation. For the purposes of this analysis, however, what is important is the value of Canadian-listed 'measured' ounces currently, rather than what they were or how they have changed.

The Australian market

In our consideration of the Australian market, we have analysed 27 companies, compared to 28 in our report of January 2010. A list of the changes is shown in the table below.

Exhibit 25: Summary of companies included and excluded in Australian market analysis compared to January 2010

Companies included since January 2010	Companies excluded since 2010
Excalibur	Chalice Gold (selling Zara Gold project)
Castle Minerals	Andean Resources (taken over by Goldcorp)
Azumah	Crescent Gold (taken over by Focus Minerals)
Central Asia Resources	Centamin Egypt (now included in London sample only)
Kentor	Lihir Gold (taken over by Newcrest)
	Dominion Mining (taken over by Kingsgate)

Source: Edison Investment Research

Taking these changes into account, a summary of the updated results by resource category sub-sector is given in the table below.

Exhibit 26: Australian gold sector summary valuation with respect to resource category

Resource categorisation	Inferred	Indicated and inferred	Measured, indicated and inferred	Total
October 2012 analysis				
Number of companies	**2**	**6**	**19**	**27**
%	**7**	**22**	**71**	
Market cap (US$m)	**16**	**368**	**27,691**	**28,075**
%	**0**	**1**	**99**	
Net cash (US$m)	**13**	**40**	**(830)**	**(778)**
%	**2**	**5**	**(107)**	
EV (US$m)	**3**	**329**	**28,522**	**28,853**
%	**0**	**1**	**99**	
Total oz (m)	**0.4**	**18.8**	**315.9**	**335.2**
%	**0**	**6**	**94**	
EV/total oz (US$)	**8.33**	**17.44**	**90.27**	**86.09**
January 2010 analysis				
Number of companies	4	9	15	28
%	14	32	54	
Market cap (US$m)	209	2,800	29,718	32,726
%	0	9	91	
Net cash (US$m)	11	152	99	262
%	4	58	38	
EV (US$m)	198	2,647	29,619	32,465
%	0	8	92	
Total oz (m)	2.2	26.9	140.3	169.3
%	1	16	83	
EV/oz (US$)	91.47	98.57	211.14	191.75

Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012.

Headline observations at this stage are as follows:

- The collapse in values of the sub-sectors with either 'inferred' or 'indicated and inferred' ounces only.
- The aggregate flip from an overall net cash position to an overall net debt position.
- A reduction in resource ounces in the 'inferred' only and 'indicated and inferred' only categories, but a doubling of resources among companies with all three categories of resources (albeit partly as a result of acquisition).

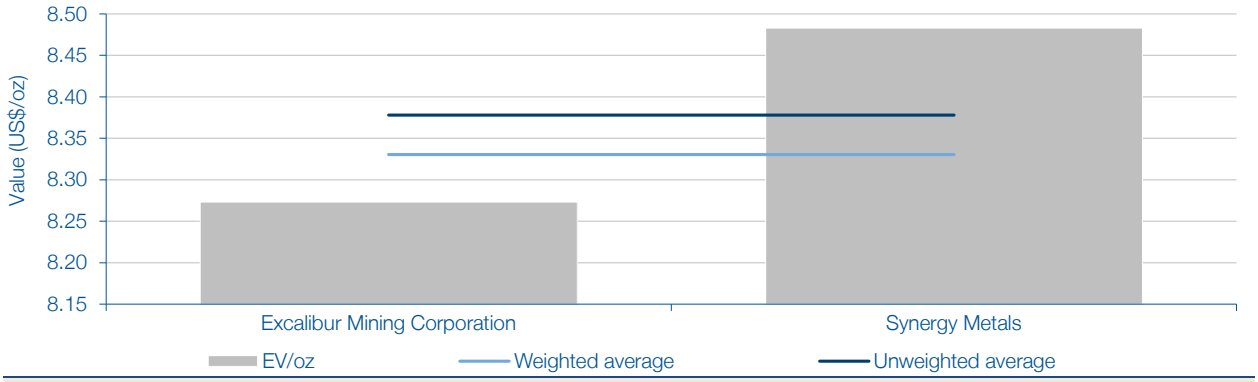
Note that, in this respect, the Australian market exhibits a similar pattern of development to the Canadian market, but both contrast somewhat with the London market, in which cash positions

have risen across all three categories of resource ounces and the values of companies with 'indicated and inferred' ounces only have held up well.

The value of inferred ounces in Australia

Like London and Canadian markets, the analysis of the average value of an 'inferred' ounce in Australia has been significantly affected by changes in the sample group, with three of the four original companies in January 2010 having promoted a portion of their resources into the 'measured' category. The remaining one, Synergy Metals, has then been joined by Excalibur to make up the sample group.

Exhibit 27: Implied value of 'inferred' ounces listed in Australia (US$), by company and averages



Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012; producers in blue, explorers in grey.

Several features of the analysis are noteworthy:

- Both companies in the sample have remarkably similar valuations (note the dropped scale on the y-axis on the graph).
- The weighted average value of US$8.33/oz compares with a value of US$91.47/oz in January 2010, and values of minus US$5.04/oz in London and (positive) US$3.84/oz in Canada. A summary of the progression in value of Australian-listed 'inferred' ounces with respect to time and the gold price is as follows:

Exhibit 28: Evolution of the value of Australian-listed 'inferred' gold ounces with respect to gold price, 2010 to present

	January 2010	August 2012
Average gold price (US$/oz)	1,118	1,626
Canadian-listed 'inferred' gold oz valuation	91.47	8.33

Source: Edison Investment Research, Kitco

- The weighted average market capitalisation per ounce of the companies is US$41.49 (versus US$20.98/oz in London and US$6.24/oz in Canada), reflecting, among other things, the fact that Australian-listed companies in the sub-sector have far more aggregate cash on their balance sheets relative to the sizes of their resources.

The value of an 'indicated' ounce in Australia

A summary of those companies with 'indicated' and 'inferred' ounces only is given in the table below.

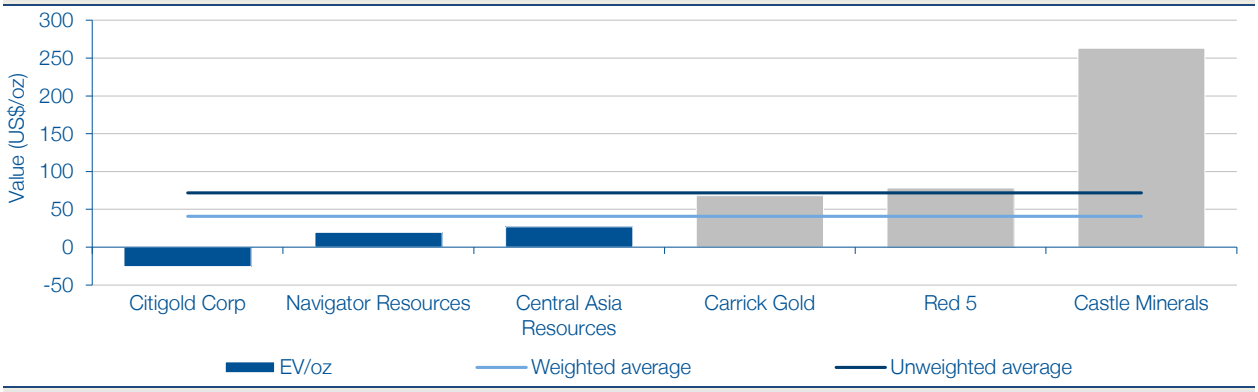
Exhibit 29: Sub-sector summary of Australian-listed companies with 'indicated' and 'inferred' resource ounces only

Resource category	Number of companies	Market cap (US$m)	Net cash (US$m)	EV (US$m)	Measured	Indicated	Inferred	Total oz (m)	EV per total oz (US$)
October 2012									
Indicated and inferred	6	368	40	329	0.0	5.3	13.5	18.8	17.44
January 2010	9	2,800	152	2,647	0.0	10.3	16.5	26.9	98.57

Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012.

As with their Canadian counterparts, the Australian sub-sector with 'indicated and inferred' ounces only has also experienced significant change in the three years under review, with five of the nine original companies in January 2010 having promoted a portion of their resources into the 'measured' category, one (Andean) having been taken over by Goldcorp and one (Chalice) having agreed to sell its lead project (Zara) to China SFECO. Of the remaining two companies, the implied value of Red 5's 'indicated' ounces has declined moderately, while the implied (albeit negative) value of Citigold's 'indicated' ounces has improved substantially.

Exhibit 30: Implied value per 'indicated' resource ounce, Australian market, by company (US$)



Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012; producers in blue, explorers in grey.

On the basis of the above sample, the weighted average value of an 'indicated' ounce listed in Australia is US$40.71/oz compared to US$143.43/oz (excluding Witwatersrand ounces) in January 2010 and compared to US$53.57/oz in Canada and US$134.36/oz in London.

Notably, the implied values for 'indicated' ounces of all of the companies lie within one standard deviation of the mean, with the exception of Castle Minerals.

Exhibit 31: Evolution of the value of Australian-listed 'indicated' gold ounces with respect to gold price, 2010 to present

	January 2010	August 2012
Average gold price (US$/oz)	1,118	1,626
Australian-listed 'indicated' gold oz valuation	109.96	40.71
Australian-listed 'indicated' gold oz valuation (excl Witwatersrand oz)	143.43	40.71

Source: Edison Investment Research, Kitco

Three of the six companies considered (Citigold, Navigator and Central Asia Resources) are producers and the remaining three are explorers, demonstrating, in this instance, that producers' ounces are not necessarily more highly rated than explorers' ounces.

The value of a 'measured' ounce in Australia

Since January 2010, approximately 7.1Moz of resources have been lost from the sub-sector that contains 'measured, indicated and inferred' ounces in Australia as a result both of migration out of the sector and acquisitions, while approximately 9Moz has been added as a result of the takeovers of Conquest Mining and Anatolia Minerals by companies already represented in the sub-sector (Catalpa and Avoca, respectively). A summary of the sub-sector after these changes is as follows:

Exhibit 32: Sub-sector summary of companies with 'measured, indicated & inferred' resource ounces (Australian market)

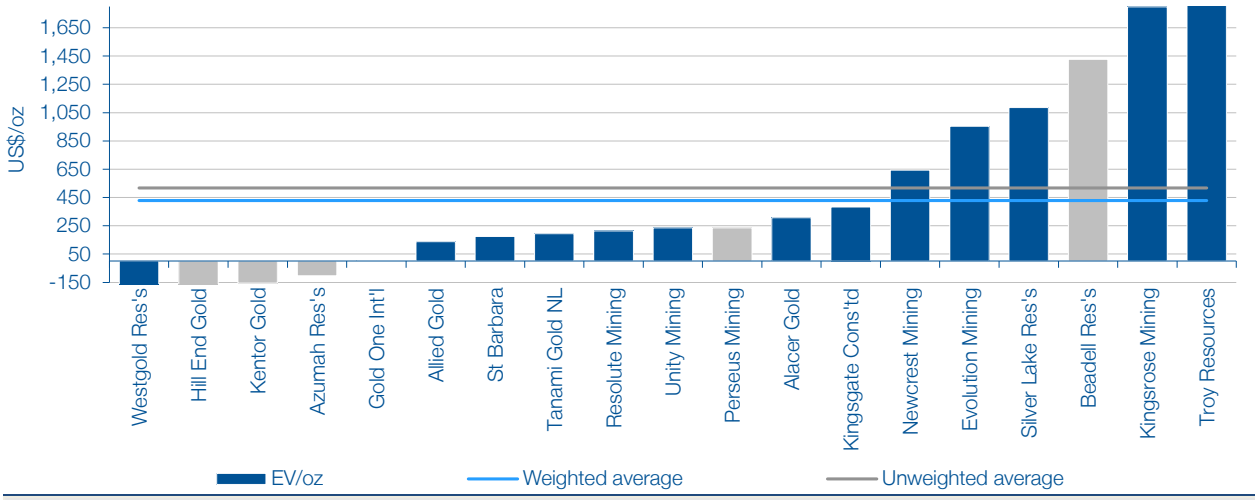
Resource category	Number of companies	Market cap (US$m)	Net cash (US$m)	EV (US$m)	Measured	Indicated	Inferred	Total oz (m)	EV per total oz (US$)
October 2012									
Measured, indicated and inferred	19	27,691	(830)	28,522	43.8	229.3	42.8	315.9	90.27
Measured, indicated and inferred (excl Wits oz)	18	26,966	(1,066)	28,031	37.2	218.5	37.5	293.3	95.59
January 2010	15	29,718	99	29,619	19.3	83.2	37.8	140.3	211.14

Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012.

Of note is the relatively small decline in both market capitalisation and enterprise value within this sub-sector, but, as with the Canadian market, a relatively large (>100%) increase in total resources.

Exhibit 33 illustrates the implied valuations for 'measured' ounces in the sub-sector, by company.

Exhibit 33: Implied value per 'measured' resource ounce, Australia, by company (US$)



Source: Edison Investment Research, Bloomberg, Thomson Datastream. Note: Prices as at August 2012; producers in blue, explorers in grey.

On this basis, the weighted average value of a 'measured' resource ounce, listed in the Australian market is US$429.54/oz (or US$505.68/oz excluding the Witwatersrand basin), compared to US$738.55/oz in January 2010 and compared to US$408.23/oz in Canada currently and US$198.23/oz in London.

The evolution of the valuation of Australian-listed 'measured' ounces with respect to the gold price is shown in the table below.

Exhibit 34: Evolution of the value of Australian-listed 'measured' gold ounces versus the gold price, 2010 to present

	January 2010	August 2012
Average gold price (US$/oz)	1,118	1,626
Australian-listed 'measured' gold oz valuation	738.55	429.54
Australian-listed 'measured' gold oz valuation (excl Wits oz)	738.55	505.68

Source: Edison Investment Research, Kitco

The value of ounces in the ground – summary and observations

A summary of the initial results arising from the analysis is shown in the table below.

Exhibit 35: Global gold sector valuation with respect to resource category summary, by market and versus January 2010

	August 2012			January 2010			Variance (%)		
	Measured	Indicated	Inferred	Measured	Indicated	Inferred	Measured	Indicated	Inferred
London market	198.23	134.36	(5.04)	403.53	85.94	3.78	(50.9)	56.3	(233.3)
Canadian market	429.43	53.57	3.84	283.68	243.76	62.01	51.4	(78.0)	(93.8)
Australian market	505.68	40.71	8.33	738.55	143.43	91.47	(31.5)	(71.6)	(90.9)
Arithmetic mean	**377.78**	**76.21**	**2.38**	**475.25**	**157.71**	**52.42**	**(20.5)**	**(51.7)**	**(95.5)**

Source: Edison Investment Research. Note: Excludes Witwatersrand basin ounces.

The results of this differential analysis are always a dynamic balance between the valuations of the different categorisations of resources, ie the valuation of one category of resources affects the valuations of the others within any one market. NB Recall that, whereas the headline increase in value of Canadian 'measured' ounces is 51.4%, a better representation of the evolution of value within this sub-sector is probably a decline of the order of 20-30% from c US$549/oz, given the distorting effect of Lake Shore Gold in the 'indicated' category in January 2010 (see page 15 for explanation). Nevertheless, obvious from the results is the exceptionally large decline in values of 'inferred' ounces generally and 'indicated' ounces in Canada and Australia over the course of the past three years and the more moderate decline in the value of the high category (ie 'measured') ounces. By contrast, the London market has demonstrated a somewhat contrary pattern, with 'inferred' and 'measured' ounces declining the most, but the value of 'indicated' ounces actually increasing (subject to acceptance of the proviso above about Canadian 'measured' ounces). Note that all these changes in valuation occurred during a period in which the gold price rose by 45.4%, from US$1,118/oz to US$1,626/oz.

In addition, whereas the range of valuations across the three markets in January 2010 was US$77.08/oz for 'inferred' ounces, US$157.82/oz for 'indicated' ounces and US$454.87/oz for 'measured' ounces, by August 2012 it had reduced to US$13.37/oz for 'inferred' ounces (ie US$8.33/oz minus minus US$5.04/oz), US$93.65/oz for 'indicated' ounces and US$307.45/oz for 'measured' ounces. As such, the analysis also demonstrates a marked convergence in the valuations in all three categories of resource ounces across the three markets.

Explorers versus producers

In the above analysis, different categorisations are valued on an industry-wide basis. That is to say, explorers and producers are considered together, within the same sample groups. While it is self-evidently possible for individual explorers in any and every category to trade at premium valuations, it is nevertheless true that across the entire sample, explorers do trade at a discount to their producing counterparts.

A summary of the difference in the valuations of explorers, compared to producers, by market is shown below. Note that in instances where a grouping was not represented in a sub-sector (eg 'inferred' only producers), the valuation was assumed to be the same as that for explorers.

Exhibit 36: Global gold sector valuation with respect to resource category, by company function

	Producers			Explorers			Total		
	Measured	Indicated	Inferred	Measured	Indicated	Inferred	Measured	Indicated	Inferred
London market	*227.92	765.62	(5.04)	94.54	50.21	(5.04)	198.23	134.36	(5.04)
Canadian market	506.79	56.26	3.84	(37.06)	52.63	3.84	429.43	53.57	3.84
Australian market	727.97	9.44	8.33	236.33	83.52	8.33	505.68	40.71	8.33
Arithmetic mean	**487.56**	**277.11**	**2.38**	**97.94**	**62.12**	**2.38**	**377.78**	**76.21**	**2.38**

Source: Edison Investment Research. Note: Excludes Witwatersrand basin ounces; *With 'indicated' valued at US$134.36/oz.

Obvious features to note within the analysis are:

- The London producers' 'indicated' valuation is dominated by the valuation of Medusa (a profitable producer that was identified as a statistical outlier in January 2010). Accepting the valuation would result in a large, negative valuation for London producers' 'measured' ounces (hence the valuation for 'indicated' ounces used in determining the valuation of 'measured' ounces is US$134.36/oz, ie the industry-wide weighted average), as noted above. Note that for the purposes of the remainder of this report, the values of ounces owned by explorers are of far more significance than those of producers.
- Canadian explorers' 'measured' ounces attract a negative valuation. While this is *prima facie* nonsensical, it has been observed by Edison to be a fairly consistent feature of the Canadian market over the course of the past three years.
- Unusually, of the six Australian companies with 'indicated and inferred' resources only, the three explorers have implied valuations for their 'indicated' ounces that are higher than the corresponding valuations for the three producers (see Exhibit 30).

Investors should also be aware that, notwithstanding the above benchmarks, maximum and minimum valuations may diverge substantially from the average, as shown below.

Exhibit 37: Range of valuations of explorers' resources with respect to resource category, by market

	Maximum			Explorers' average			Minimum		
	Measured	Indicated	Inferred	Measured	Indicated	Inferred	Measured	Indicated	Inferred
London market	568.58	327.67	23.26	94.54	50.21	(5.04)	(13.98)	13.33	(11.65)
Canadian market	9,126.33	154.43	6.48	(37.06)	52.63	3.84	(730.39)	2.33	2.75
Australian market	1,426.20	262.93	8.48	236.33	83.52	8.33	(382.52)	67.95	8.27

Source: Edison Investment Research. Note: Excludes Witwatersrand basin ounces.

Compared to the range of valuations exhibited in January 2010, it is notable that the range in August 2012 has generally narrowed, especially among 'indicated' and 'inferred' ounces listed in Canada and Australia. Nevertheless, it is self-evident that the range for one category of resources within a market (eg maximum Canadian 'measured' ounces versus minimum Canadian 'measured' ounces) remains large. Also of note are the negative implied valuations for 'measured' ounces at the minimum for all three markets (implying value destruction in the event of ongoing exploration, with a view to defining more 'measured' ounces).

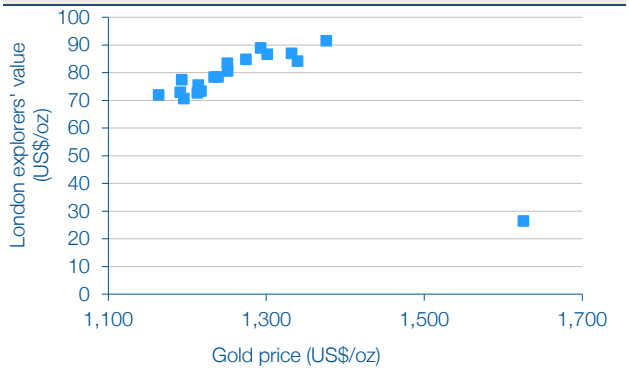
Differential resource valuations' correlations to the gold price

During 2010, while the gold price moved (escalated) between US$1,164/oz and US$1,376/oz and after we had published our last report on the subject *Gold – Valuation benchmarks are obsolete*, Edison studied the progression of the various resource categories' valuations with respect to the gold price.

During this period, we observed a variety of relationships. In combination with the updated figures for August 2012, however, we can see that the relationship between the gold price and the resource categories' differential valuations is non-linear. However, as the relationship between the overall blended, average resource valuation and the gold price is also non-linear, this is not a surprise.

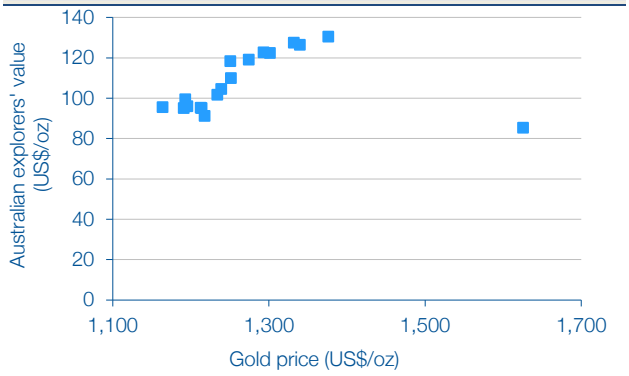
Nevertheless, we can see that the trend among the explorers was similar to the trend in the overall industry. In general, over the short period between July and October 2012 in which its value was tracked, the overall, blended, average in-situ resource ounce valuation exhibited a positive, statistically significant correlation with the gold price across all three markets. All three markets subsequently experienced a significant devaluation between 2010 and 2012, with the greatest decline in the London market and the least in the Australian market.

Exhibit 38: London explorers, 2010-12 (US$ per total oz)



Source: Edison Investment Research

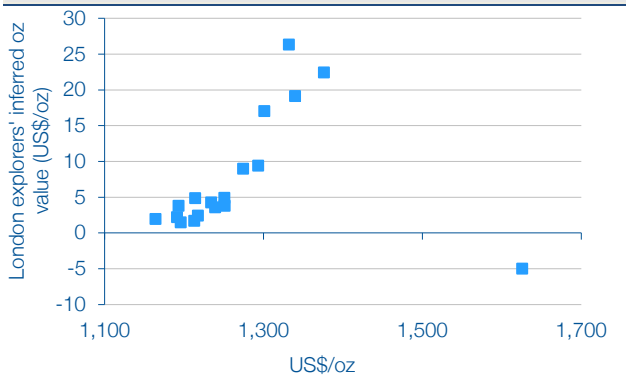
Exhibit 39: Australian explorers, 2010-12 (US$ per total oz)



Source: Edison Investment Research

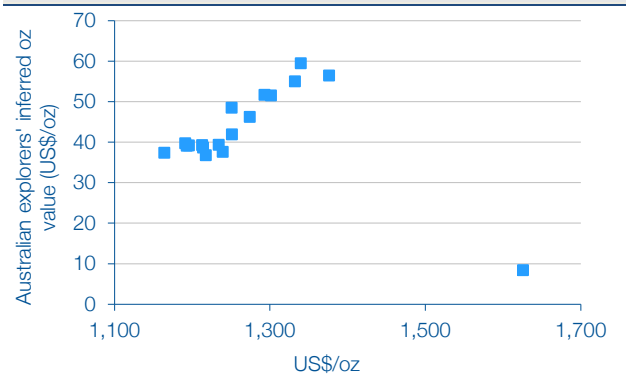
Within this general pattern, the value of London explorers' 'inferred' ounces has declined the most; the value of Australian explorers' 'inferred' ounces has declined the least:

Exhibit 40: London 'inferred' oz value, 2010-12 (US$/oz)



Source: Edison Investment Research

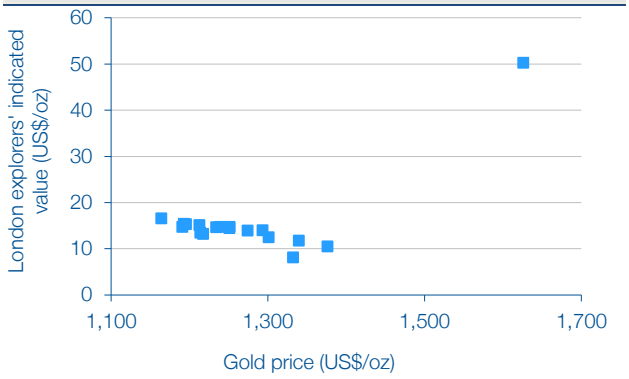
Exhibit 41: Australian 'inferred' oz value, 2010-12 (US$/oz)



Source: Edison Investment Research

By contrast, the value of London-listed 'indicated' ounces actually rose, while the value of Australian 'indicated' ounces declined the most.

Exhibit 42: London 'indicated' oz value, 2010-12 (US$/oz)



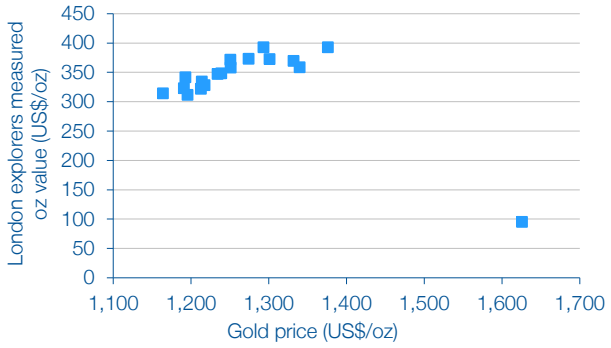
Source: Edison Investment Research

Exhibit 43: Australian 'indicated' oz, 2010-12 (US$/oz)

Source: Edison Investment Research

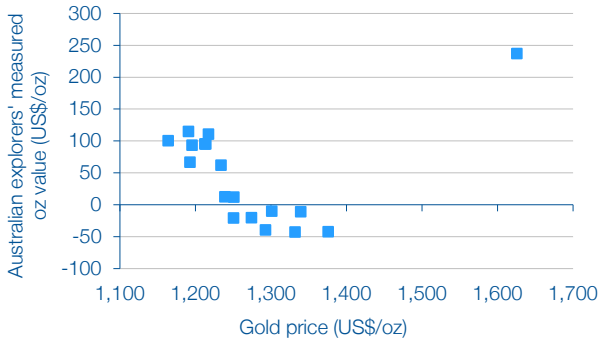
Consistent with this pattern, the value of 'measured' ounces in London fell the most, while those in Australia increased the most.

Exhibit 44: London 'measured' oz value, 2010-12 (US$/oz)



Source: Edison Investment Research

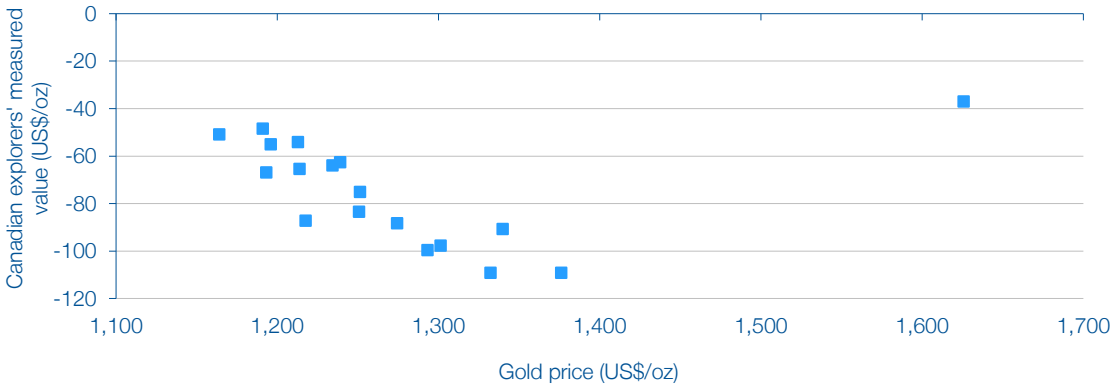
Exhibit 45: Australian 'measured' oz, 2010-12 (US$/oz)



Source: Edison Investment Research

However, while the value of Australian explorers' 'measured' ounces reverted to the positive, the value for Canadian ounces did not (as shown below).

Exhibit 46: Canadian 'measured' oz value, 2010-12 (US$/oz)



Source: Edison Investment Research

Typically, Edison would discount a negative value for 'measured' ounces as being nonsensical. However, in this case we can see that the implied value of Canadian 'measured' ounces has been consistently negative over a prolonged period of time and across a range of gold prices. Apart from the *prima facie* interpretation, an alternative explanation is that the Canadian market discounts the value of all ounces as an exploration project evolves into the close-spaced drilling phase of its development in order to define the resource more closely.

The evolution of value in exploration companies

In the January 2010 publication, *Gold – Valuation benchmarks are obsolete*, Edison and BDO calculated global discovery costs of US$7.16 for 'inferred' ounces, US$10.50 for 'indicated' and US$36.82 for 'measured' ounces.

On this basis, the budget required to delineate a resource of 100oz in the proportions 18 measured to 60 indicated to 22 inferred (being the global average – see Exhibit 1) is US$1,460. For the purposes of this example, it will be assumed that the resource is delineated as follows:

Exhibit 47: Theoretical explorer's resource evolution by year

Resource category	Year 0	Year 1	Year 2	Year 3
Measured	0	0	0	18
Indicated	0	0	40	60
Inferred	0	100	60	22
Total	**0**	**100**	**100**	**100**

Source: Edison Investment Research

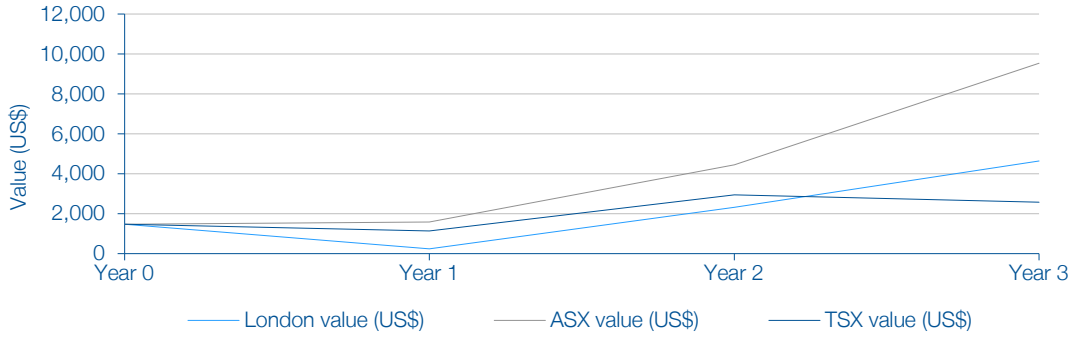
Then assuming that the ounces drilled in each centre of mining finance carry the values calculated previously (as shown in Exhibit 48) and that an exploration company is valued solely on the basis of its cash plus resource, the company's valuation will develop, depending upon whether it is listed in London, Canada or Australia, as shown in Exhibit 49.

Exhibit 48: Valuation of theoretical explorer's resource ounces, by categorisation

	Measured	Indicated	Inferred
London market	94.54	50.21	(5.04)
Canadian market	(37.06)	52.63	3.84
Australian market	236.33	83.52	8.33

Source: Edison Investment Research

Exhibit 49: Valuation of theoretical explorer with developing 100oz resource, by year and by market (US$)



Source: Edison Investment Research

Of note in this respect is the value destruction in London in Year 1, when only 'inferred' resources have been delineated, but the similarity of valuations in Canada and Australia. Equally apparent is the similarity between the London and Canadian valuation scenarios in Year 2 (when 'indicated and inferred' resources have been delineated), but the premium valuation of the Australian-listed scenario. This Australian premium then becomes more marked in Year 3 (when 'measured' ounces are delineated as well), while the Canadian-listed valuation falls relative to the London one to reflect the consistently negative implied valuation of 'measured' ounces in Canadian-listed exploration vehicles.

The evolution of value in development & production companies

Valuation versus stage – the value of oz destined for production

Edison has approximately 60 mining companies under full-time coverage. As a result, it covers companies at every stage of development, from resource definition to production. While companies at the exploration stage are typically valued with respect to their resource base and their blue-sky exploration potential (as analysed previously), development companies and companies in production are typically valued in relation to the value of cash flows derived from the mine, discounted to present value. There are two principal methods used to achieve such valuations:

1. Discounted cash flow (DCF)
2. Discounted dividend flow (DDF)

However, there are notable differences between these two methodologies.

For example, consider a company that requires US$50m of capex in order to generate positive cash flow of US$20m every year thereafter for five years. A (highly simplified) rendering of its cash flow statement, including potential dividends (assuming that all possible 'excess' cash is distributed to shareholders immediately it is available, ie after debt has been repaid) is shown below.

Exhibit 50: Discounted cash flow versus discounted dividend flow, comparative valuations

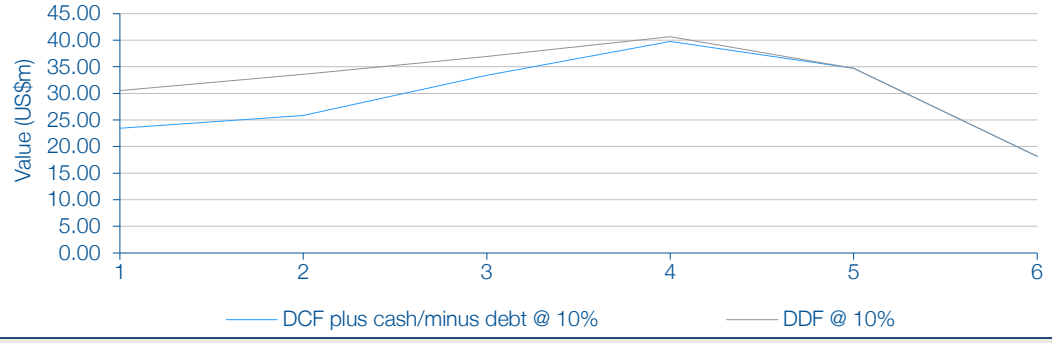
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cash flow from operations	0	20	20	20	20	20
Capital expenditure	(50)					
Financing	0					
Net cash flow	(50)	20	20	20	20	20
Net cash at start of year	0	(50)	(30)	(10)	0	0
Net cash at end of year before dividend	(50)	(30)	(10)	10	20	20
Dividend	0	0	0	10	20	20
Cash after dividend	(50)	(30)	(10)	0	0	0

Source: Edison Investment Research

In this example, discounting at a rate of 10%, the discounted value of the net cash flows (as calculated by Microsoft Excel™, ie the first year is discounted as well) is US$23.47m. By contrast, the discounted value of dividends is US$30.54m. Note that the undiscounted value of both is US$50m; hence, the sole cause of the differing valuations is the timing of the flows rather than their quantum.

Moreover, this discrepancy continues until the debt associated with the project is fully repaid, as shown in the exhibit below, which compares the progression of the DDF over time with the alternative DCF method (ie DCF minus net debt), in the event that the same 10% discount rate is applied to both.

Exhibit 51: Comparative valuation methodologies, DCF versus DDF, at consistent 10% discount rate, over time



Source: Edison Investment Research

Note that (as discussed above) the two valuations do no coalesce until Year 5, when the debt associated with the project has been fully repaid.

Given that a company may not have more than one value at any one time, this discrepancy may be rationalised in any one of three ways:

- The discount rate applied to the DDF is too low.
- The discount rate applied to the DCF is too high.
- A combination of the two.

Edison has long used a discount rate of 10% in its DDF models in order to reflect the estimated cost of equity, based on the risk-free rate plus an estimated equity risk premium. If this is accepted (as in the example above), it follows that the cost of capital (as represented by the blended average cost of debt and equity) should be lower.

Therefore, in this case Edison asserts that the 'true' valuation of the company is given by the discounted dividend valuation, as this is the present value of the dividends that an investor would be left holding after equity dilution and once the capital value of the project has reverted to zero. The DCF valuation, by contrast, reflects gross cash flows that have to be shared between equity and debt holders to varying degrees, irregularly over time, and invariably does not include equity dilution as a result of necessary fund-raising activities.

Having made this assertion for the example above, it is then possible to calculate the 'correct' (ie lower) discount rate that should be applied to cash flows in order that their value matches that of the DDF discounted at 10%:

Exhibit 52: DCF discount rates implied by DDF valuation at 10%

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
DDF discount rate	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Implied DCF discount rate	6.73%	6.29%	7.52%	8.97%	10.00%	10.00%

Source: Edison Investment Research

Valuation methodologies compared

There are typically two methods used in evaluating income streams in the mining industry:

- Nominal, in which an inflation assumption is made about the price of the metal/commodity produced and unit working costs. NB Typically, the inflation assumption made is the same for both. The resulting income stream is then discounted at a nominal discount rate (eg 10%).
- Flat/real, in which prices and costs are both expressed in real terms and a discount rate based on real interest rates is applied to the resulting income stream.

In theory, the two should be equivalent. For example, the nominal case in which a long-term rate of inflation of 2.5% and a 10% nominal discount rate are applied yields the same value as a real discount rate of 7.31% (ie 1.025/1.10) applied to a real income stream.

In recognition of the fact that mining industry costs typically increase at a higher rate of inflation than prices over the longer term (as mines get older and deeper etc), Edison typically adopts a valuation methodology that might best be described as flat/nominal. In this case, a nominal discount rate is applied to a real income stream. Hence, a mine might be producing at a gold price of US$800/oz with unit costs of production of US$500/oz; however, if the gold price doubles to US$1,600/oz, it is assumed that costs will more than double, to US$1,300/oz (in this case +160%), such that the overall margin in US dollars per ounce terms (but not percentage terms) and therefore the overall profitability of the mine, is maintained at US$300/oz. As such, Edison's valuation methodology is typically more conservative than those conventionally used. Nevertheless, it recognises the close relationship between mining companies' unit costs and unit revenues, as observed through history. Moreover, given the cost and price assumptions inherent in the analysis, it also follows that the relative valuation of companies is at least as significant as the absolute one.

The universe of Edison mining coverage

In transitioning from exploration into production, mining companies typically progress a project through a number of studies in order to establish its economic viability and raise finance to develop it. In general, these include:

- A scoping study, possibly performed internally by the company.
- A pre-feasibility study (PFS), typically performed by one or more external consultants.
- A bankable feasibility study (BFS), performed to a level of accuracy acceptable to banks in order to raise finance.

Once a bankable feasibility study has been completed – and assuming that it is positive – a company then typically looks to raise finance (typically both debt and equity), after which it constructs the project and ramps up production to the design specifications of the plant.

Since (with the possible exception of scoping studies and pre-feasibility studies) each milestone is on the critical path to development and each must be reached in sequence in order for the project to be brought successfully to fruition, the attainment of each one effectively represents a lowering of the risk that the project fails. For financial purposes, this risk (and the measurement thereof) may be encapsulated in the discount rate applied to a project. Conversely, by manipulating the discount rate applied to a project such that its value is the same as the value of the listed entity in which it exists, the implied discount rate for a particular project at a particular stage may be determined.

As stated previously, Edison has over 60 companies under coverage at the current time, at all stages of the developmental profile, which Edison values according to the flat/nominal valuation methodology described above. From this sample, it is then possible to determine the implied discount rates applied to each company by the equity market at any one time in order to justify their share prices. If the companies are then sorted according to the developmental stage of their projects, it is then possible to determine the range of discount rates applied to projects at a certain stage.

For the purposes of the statistical analysis, the following numerical monikers have been used:

1 – Scoping study

2 – Pre-feasibility study (PFS)

3 – Bankable feasibility study (BFS)

4 – Development (ie funding raised and in the process of constructing the project)

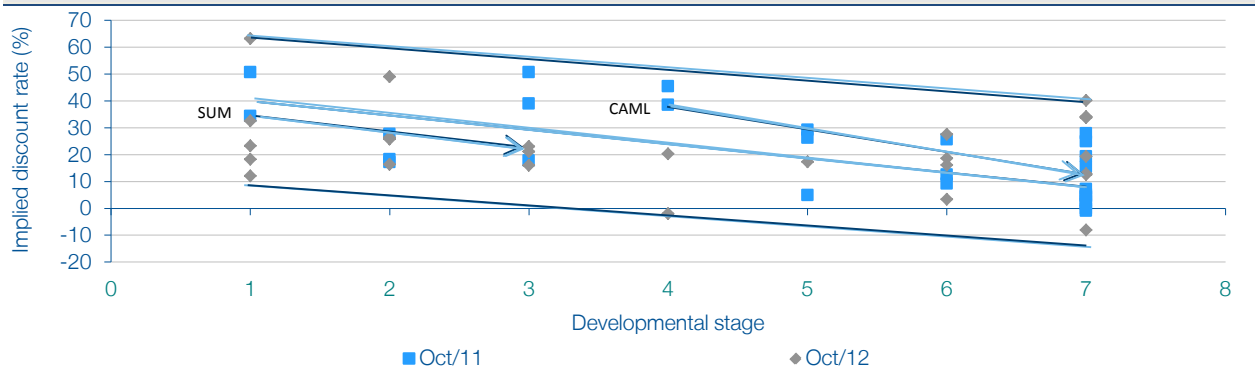
5 – Production ramp-up

6 – Production from subsidiary asset (ie not the main asset)

7 – Full production from main asset

In the case of Edison's clients, this analysis has now been performed twice (once in October 2011 and then again in October 2012). The results from such an analysis (including Edison's interpretation of the upper, lower and mean trend lines) are as shown in Exhibit 53 below.

Exhibit 53: Implied discount rates applied to companies at varying developmental stages



Source: Edison Investment Research

A noteworthy feature of the analysis is the widening of the 'upper' and 'lower' bands in October 2012 compared to October 2011. In addition, the slope of the lines of those companies that have moved from one developmental stage to another (ie Sumatra Copper & Gold and Central Asia Metals) appears to support the broad interpretation of the trend.

Dilution of equity holders is accounted for by assuming (typically) a 50:50 funding split between debt and equity and assuming that the equity is raised at the share price prevailing at the time of the analysis.

Note that the mean trend line passes approximately through the mean of the sample of each developmental stage, with the exception of those for pre-feasibility stage companies (ie development stage 2). Given the mean implied discount rate for both scoping study (1) projects and BFS (3) projects, it is very likely that the anomaly for PFS (2) stage projects is the result of a sampling error (ie the sample is too small to indicate the actual mean accurately).

In numerical terms, a summary of the discount rates and range applied by the market to companies at each of these stages of development (as interpreted by Edison) is as follows:

Exhibit 54: Discount rates applied to companies at differing stages of development

Development stage	Scoping study	PFS	BFS	Development	Ramp-up	Subsidiary production	Production from main asset
Numerical moniker (as above)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Maximum discount rate (%)	65.0	61.0	58.0	54.0	49.0	45.0	40.0
Mean discount rate (%)*	**42.0**	**36.0**	**31.0**	**25.6**	**20.0**	**15.7**	**10.0**
Minimum discount rate (%)	9.0	6.0	2.0	(2.0)	(4.0)	(8.0)	(11.0)

Source: Edison Investment Research. Note: *As interpreted by Edison Investment Research.

NonSuch Gold Ltd – a hypothetical gold mining company valued at every stage of its development

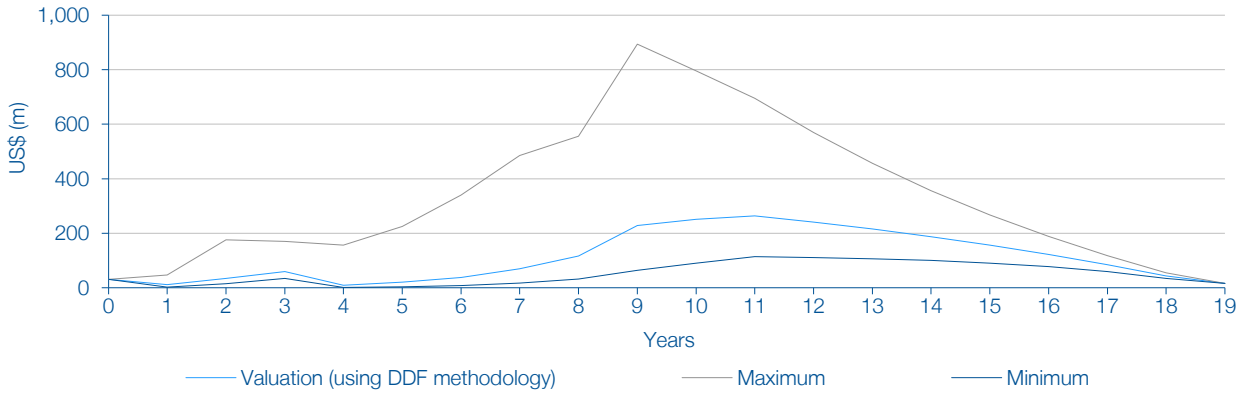
Having calculated average benchmark valuations for both exploration (Exhibit 36) and development (Exhibit 54) companies, it is possible to combine the two to create a fully integrated valuation for a notional company, with a 1Moz reserve and a 100koz per annum production rate, at each stage of its development.

Key assumptions made in valuing this company are as follows:

- The company raises equity funds in Year 0 for exploration purposes. It delineates an inferred resource in Year 1, an 'indicated and inferred' resource in Year 2 (in the ratio 40.0:60.0 'indicated': 'inferred' – see Exhibit 1) and a 'measured, indicated and inferred' resource in Year 3 (in the ratio 18.3:60.0:21.6 'measured':'indicated':'inferred' – see Exhibit 1). It then raises additional equity funds and commissions a scoping study, a pre-feasibility study and a bankable feasibility study in years 4, 5 and 6, respectively. In Year 7 it raises a final round of equity funding in addition to debt funding and embarks on the first of three years of capital expenditure; production ramp-up begins in Year 8 and full production is achieved in Year 9. Full production is maintained from Year 9 to Year 18 inclusive (ie 10 years). Working capital is released in Year 19 when the company reverts to being an exploration entity with cash and an 'inferred' resource.
- In years 0 to 3, the company is valued according to a combination of its resource (at the appropriate categorisations), assuming a London listing plus cash. Note that this only affects years 1 to 3, for which the valuation evolution profile is that of a London-listed explorer; Canadian- and Australian-listed explorers would have the profiles shown in Exhibit 49 on page 24. In years 4 to 18, NonSuch Gold Ltd is valued according to the discounted dividend flow method at the mean discount rates (as interpreted by Edison) defined and set out in Exhibit 54 plus the (undiscounted) value of the residual 'inferred' resource. Working capital is released in Year 19, such that the company reverts to being an exploration entity with cash and an 'inferred' resource only.
- Unit costs of discovery are as set out in 'The evolution of value in exploration companies' on page 24, ie US$7.16 per 'inferred' ounce, US$10.50 per 'indicated' ounce and US$36.82 per 'measured' ounce.
- Of the company's 1.276Moz resource, 1.0Moz are in the 'measured' and 'indicated' categories, which have a 100% conversion ratio into reserves.
- Study costs are estimated at 1.5% of capex (ie US$1.5m in total) and are deemed to be cumulative, ie scoping study costs contribute towards PFS costs and PFS costs towards BFS costs.
- Central, general and administrative costs amount to US$4m per annum until the company enters production, when they increase to US$7.5m per annum.
- Equity fundings are conducted at the implied value of the equity, given the state of advancement of the project, ie no discount to the prevailing share price is assumed.
- Capex amounts to US$100 per annual ounce of production, ie US$100m, or US$100 per reserve ounce.
- Debt peaks at the end of Year 8 (ie the year before full production is achieved), when gearing (ie debt/equity) reaches 100% and leverage (debt/(debt+equity)) reaches 50%.
- The cost of debt is set at 11%; return on cash deposits at 0.5%.
- A gross cash profit margin of US$725/oz has been assumed during the mine's producing phase. This could be interpreted as being derived from Edison's previous long-term gold price of US$1,350/oz and unit cash costs of production of US$635/oz or Edison's new long-term gold price (see pages 51-54) of US$1,676/oz and unit cash costs of production of US$951/oz, inter alia.
- Profits are taxed at 28% (after depreciation); there is no write-off for past exploration expenses.

On the basis of the assumptions set out above, the undiscounted value of the dividends paid out to shareholders is US$410.7m, comprising cash flow from operations (US$459.8m), minus total life-of-operation capex (US$120.1m), plus total equity funding (US$88.2m) minus terminal cash balances (US$17.2m). The valuation of the company evolves with time according to the profile shown below (NB Full financials for the company are provided on page 59).

Exhibit 55: Hypothetical gold mining company (NonSuch Gold Ltd) valuation, average within range, US$m



Source: Edison Investment Research

Two features of this profile are of note to investors:

- The value destruction in Year 1, when the company's maiden 'inferred' resource is reported (as expected – see Exhibit 49). Note that there would also have been value destruction, on average, in the event that the company was listed in Canada (albeit less). Only in Australia, where the average value of 'inferred' ounces is greater than their associated cost of discovery, would there have been value added at this stage.
- Within an otherwise generally upward trend, the average valuation of the company falls between Year 3 and Year 4. While this is often attributed to adverse newsflow, in fact it can be seen that this effect is actually a consequence of a change in the basis of the valuation of the company from resources plus cash to a DDF performed at a discount rate of 42%, to reflect the risk associated with a project at a relatively early (scoping study) stage of development.

The valuation of the company is performed according to the discounted dividend flow methodology. From this, it is then possible to calculate the discount rate to be applied to cash flows in order to generate the same result. In this case, the appropriate discount rate to be applied to cash flows is as follows:

Exhibit 56: DCF versus DDF appropriate discount rates for hypothetical company at different stages of development

Development stage	Scoping study	PFS	BFS	Development	Ramp-up	Full production (with debt)	Full production (debt repaid)	Full production
Year	4	5	6	7	8	9	10	11
DDF discount rate (%)	42.0	36.0	31.0	25.6	20.0	10.0	10.0	10.0
Implied DCF discount rate (%)	34.9	28.4	23.1	25.8	18.6	9.5	9.7	10.0
DCF/DDF factor	0.83	0.78	0.74	1.01	0.93	0.95	0.97	1.00

Source: Edison Investment Research

Since the DCF methodology involves valuing the company according to the DCF of its project plus net cash, the valuation is affected by equity financings. On a per share basis, this should make no difference if the equity is correctly priced – either a lower valuation will be divided by a lower number of shares or a higher number will be divided by a higher number of shares. However, it does make a difference at the gross EV and market cap level. One result is the variability of the DCF discount rate with respect to the DDF discount rate. In particular, the DCF discount rate is on a low and declining trend relative to the DDF discount rate before equity financing (as large negative

capital expenditure items draw nearer), whereas it is on a higher and increasing trend after equity financing (as capex recedes into history quickly and positive cash flows draw nearer), until the two come together once all debt has finally been repaid in Year 11. It also results in a discontinuity in the year that equity funding is raised (ie Year 7). In this case, the DCF discount rate shown for 'development' stage (7) is post-equity funding. The appropriate rate before equity funding is 18.6%.

Alternatively, it is possible to express the DCF valuation in respect of a standardised DCF calculated on the project at the start of capital expenditure (as might be performed by an external consultant in a PFS or BFS). In this case, discounting cash flows from Year 7, when capital expenditure starts, at a standardised rate of 10%, results in a project value (including residual study and central costs) of US$144.1m. The valuation of the company and project relative to this standardised DCF valuation may then be expressed as shown below.

Exhibit 57: Company valuation expressed with respect to standardised DCF valuation at 10% discount rate, by stage

Development stage	Scoping study	PFS	BFS	Development	Ramp-up	Full production (with debt)	Full production (debt repaid)	Full production
Year	4	5	6	7	8	9	10	11
Company valuation as pct of standardised DCF (%)	6.4	14.0	26.4	47.9	80.8	158.5	174.4	183.2
Project valuation as pct of standardised DCF (%)	(4.9)	2.8	18.2	43.0	76.7	191.8	199.3	184.2

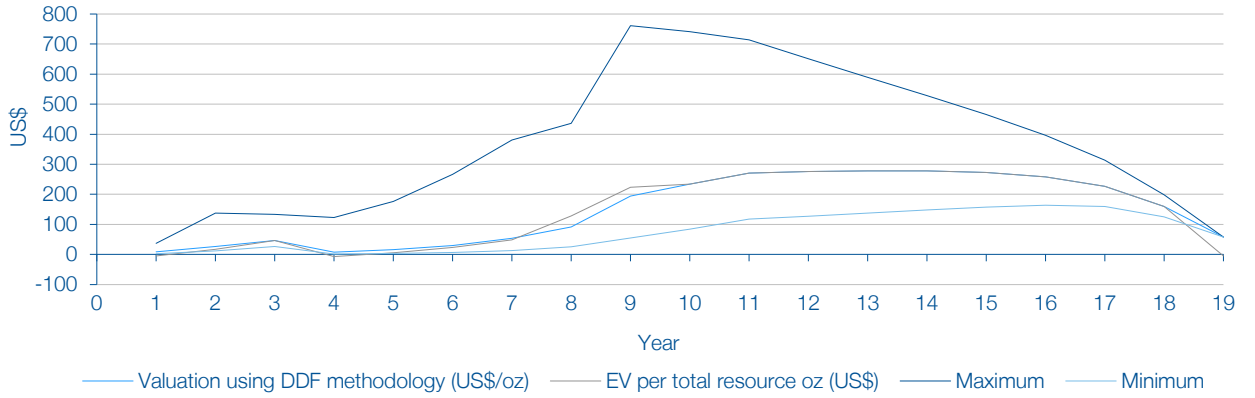
Source: Edison Investment Research

Note that the difference in the valuation of the company and the valuation of the project is accounted for by cash on the balance sheet and the value of the residual resource (ie that part of the ore-body that is not part of reserves). The negative value of the project at scoping study stage therefore indicates that the company will be valued at less than the value of cash on its balance sheet plus the residual resource (ie the 'inferred' resource in the case of NonSuch Gold Ltd).

Per ounce valuation

Having developed an appropriate valuation profile for the company, it is possible to observe how its valuation varies over time, compared to its resource base. This is shown in the chart below.

Exhibit 58: NonSuch Gold Ltd valuation (average) within range (maximum and minimum), US$ per resource ounce



Source: Edison Investment Research

Two features of the graph are notable:

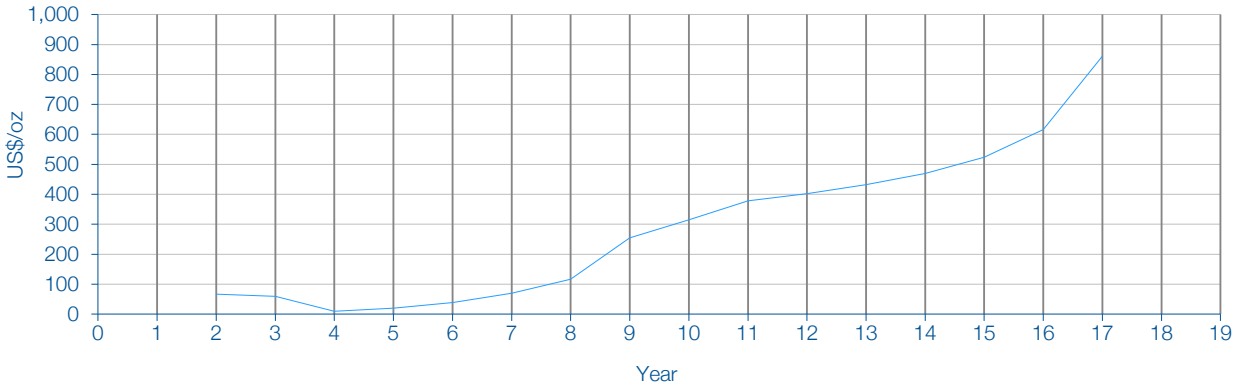
- The valuation of the average company varies significantly over time, per resource ounce, from a minimum of US$7.26/oz at scoping study stage to a maximum of US$278.16/oz in Year 13. The average, over the entire 19-year period, is US$146.66/oz (versus an observed global average, excluding Witwatersrand ounces, of US$108.43/oz – see above). By contrast, the minimum possible valuation (ie the minimum point on the 'minimum' line) is US$0.98/oz (versus

an observed minimum of US$1.85/oz market cap per resource ounce), while the maximum possible is US$761.57/oz (versus an observed maximum of US$961.96/oz for a producer).

- In addition to the average valuation of the company per resource ounce, its enterprise value per resource ounce has also been calculated. Comparing the two, we can see that the calculated EV/oz number equates closely to the actual valuation. However, rather than being invariant, both are critically dependent on the company's stage of development (and its operating parameters), eg the EV/oz of a company that has just raised finance in order to develop its project should not be compared directly with that of a company that is in production and has paid off its debt. As such, the EV/oz of the latter is an indication of what the EV/oz of the former may evolve to become, rather than what it should be.

By contrast, a standard, mining industry variation on the above methodology is to consider a company's valuation relative not to its total resource base, but instead to that portion of the resource base within the 'measured' and 'indicated' categories only, ie the enterprise value of a company per 'measured and indicated' ounce. In the case of the above company, a graph of the evolution of this valuation measurement is shown in the chart below.

Exhibit 59: NonSuch Gold Ltd valuation per 'measured and indicated' resource ounce, US$



Source: Edison Investment Research

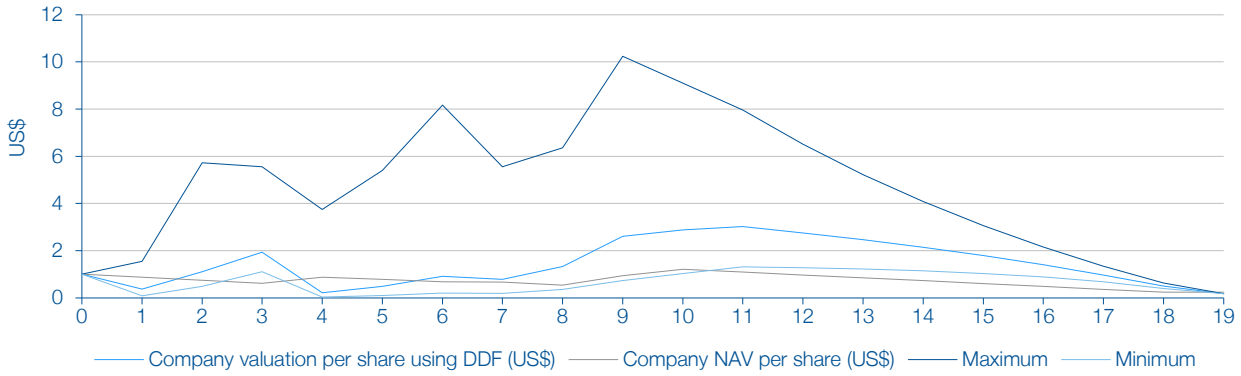
In this case, three features are of note:

- The absence of a valuation in years 0, 1, 18 and 19 when either no 'measured' or 'indicated' ounces have been delineated, or after they have been mined out.
- The effect of a residual valuation (in the form of an 'inferred' resource plus cash from the unwinding of working capital) superimposed on a declining reserve (ie the 'measured and indicated' resource) results in a valuation measurement that is not only varying, but also (with the exception of years 2-4) permanently increasing with time. As such, Edison would suggest this is a valuation methodology that should be used with care by investors, with the possible exception of early-stage companies.
- The decline in the value per 'measured and indicated' ounce between Year 2 and Year 3, reflecting a 96% increase in 'measured and indicated' resource ounces in Year 3 compared to Year 2, but only a corresponding increase of 76% in the valuation of the company.

Per share valuation

Having established a valuation for NonSuch Gold Ltd, it is then possible to calculate a value per share, by making an assumption about the price at which equity funding is raised. In this case, Edison's assumption is the same as that typically used in its discounted dividend models, ie that equity is raised at the prevailing share price in order to yield a maximum leverage ratio (debt/(debt+equity)) of 50%. Applying this assumption, the price of NonSuch Gold Ltd's shares progresses as shown below.

Exhibit 60: NonSuch Gold Ltd valuation (average) within range (maximum and minimum), per share



Source: Edison Investment Research

It will be recalled that, for the purposes of this exercise, there are three equity raisings:

- US$30.6 at par value of US$1.00/share in Year 0 to fund exploration and head office expenses to the end of Year 3, by which time the resource will have been fully drilled and delineated.
- US$21.5m in Year 4 to fund the cost of the subsequent studies (estimated at 1.5% of capex incrementally, ie the scoping study cost contributes to the PFS and the PFS to the BFS) plus head office costs to Year 8, ie a slight overestimate of the costs. This is assumed to be conducted at a price of US$1.94 (ie the value of the equity at the end of Year 3).
- US$36.1m in Year 7 to fund the equity share of the subsequent US$100m capex, such that the maximum financial leverage of the company is 50% at the end of Year 8 (ie immediately before the start of profitable production in Year 9). This is assumed to be conducted at a price of US$0.79.

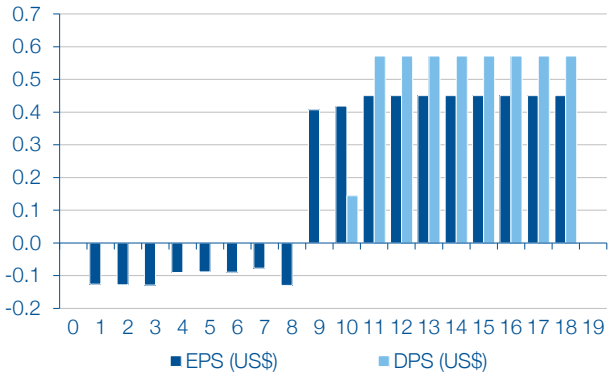
Of particular note in this respect is the 'average' assumption of the price at which equity is raised in Year 4, which acts to increase dilution in the 'maximum' case and to decrease dilution in the 'minimum' case in Exhibit 60. Nevertheless, for the average case (to which this observation does not apply), three features of NonSuch Gold's share price are of note:

- The share price falls below NAV on four occasions: the delineation of the company's maiden 'inferred' resource (Year 1), scoping study (Year 4), PFS (Year 5) and Year 19 (after the end of the life of operations).
- The share price does not again reach the 'resource based' level that it reaches in Year 3, until the start of production in Year 9 (see section on Returns, below).
- The share price falls back on the occasion of the company's major funding round in Year 7, compared to Year 6 (as expected).

Valuation measurements

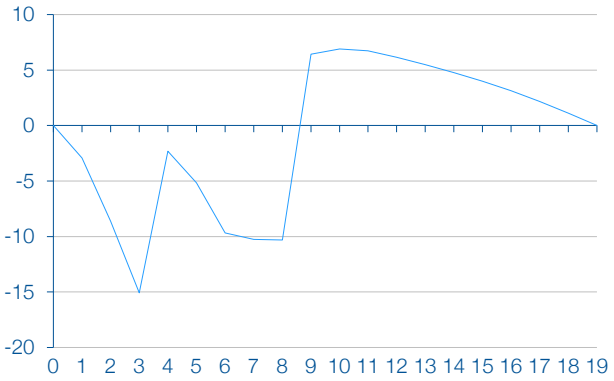
The full accounts of the company, from which the above valuation is derived, are available on page 59 of this report. Nevertheless, for illustrative purposes, it is informative to consider the evolution of the company's earnings over the period and their relationship to Edison's derived valuation (ie the predicted price to earnings, or P/E, ratio).

Exhibit 61: NonSuch Gold Ltd EPS and DPS (US$)



Source: Edison Investment Research

Exhibit 62: NonSuch Gold Ltd P/E ratio



Source: Edison Investment Research

In this case, NonSuch Gold Ltd's maximum P/E ratio is 6.9x in Year 10. While this may appear low, it is consistent with discounting an ex-growth income flow at a 10% rate for 10 years. It is also consistent with selected valuations observed in the market (eg Petropavlovsk is on 8.7x consensus current year EPS forecasts at the time of writing).

Inasmuch as observed P/E multiples exceed this figure, it may be rationalised in a number of ways, the most obvious of which are as follows:

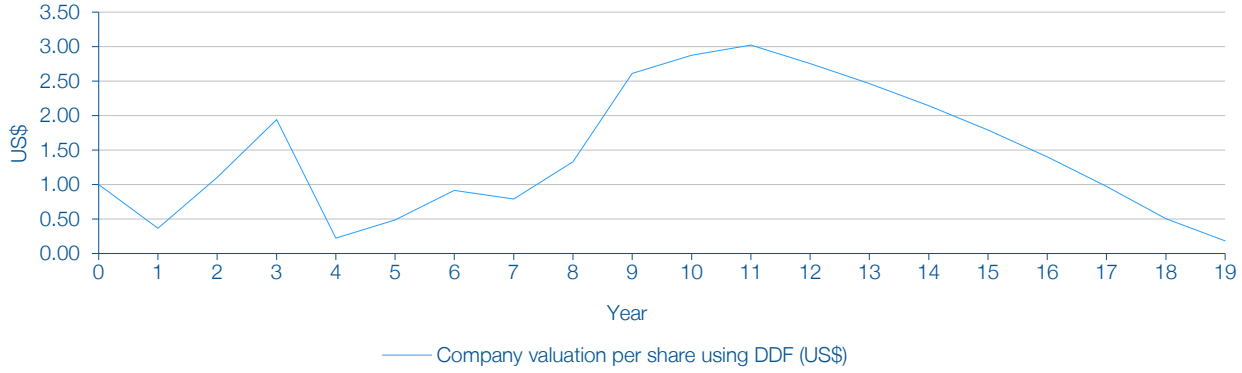
- The discount rate applied is too high (although this would seem to be contradicted, at least in the average case, by Exhibit 53).
- Blue-sky exploration potential adding to the valuation of the company through its implication of an extended life of operations.
- Expectations of future wider margins, either in the form of a higher gold price or lower unit costs of production.
- Expectations of higher future production.
- Expectation of a value adding corporate transaction.
- A combination of the above.

Sensitivities

Two key assumptions, previously highlighted, bear further consideration in the context of any discussion about NonSuch Gold Ltd's share price:

1. A 100% conversion ratio of 'measured' and 'indicated' resources into reserves. Inasmuch as the conversion might be lower in a 'real life' scenario, this would increase the value of resources delineated to the left of the graph (both company valuation in US$m and share price), relative to the right-hand side (ie years 4-19), which would remain unchanged.

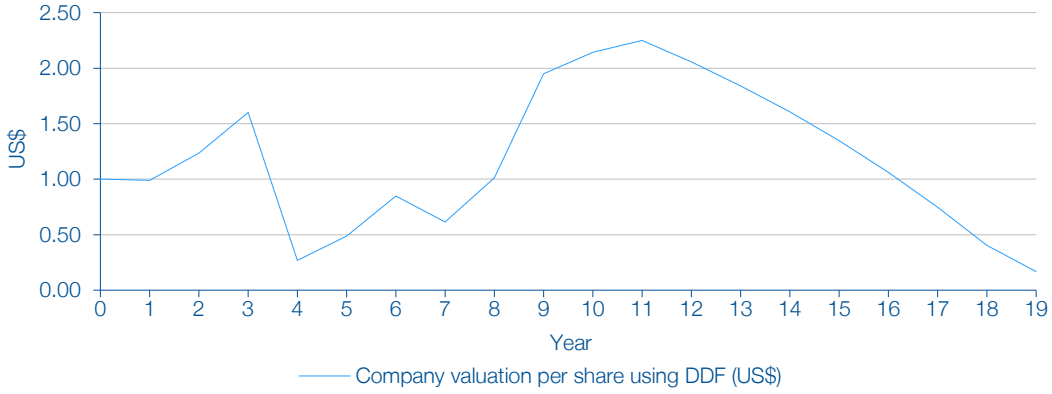
Exhibit 63: NonSuch Gold Ltd share price, by year/stage of development



Source: Edison Investment Research

2. Equity fundings are conducted at the implied value of the equity, given the state of advancement of the project, ie no discount to the prevailing share price is assumed. Inasmuch as a share price discount and therefore a degree of dilution would be likely, it would lower the right-hand side of the share price graph (from years 4-6) by one diluting event and (from years 7-19) by two diluting events. For example, the graph below shows NonSuch Gold Ltd's share price over its life of operations in the event that it raises equity funds instead at a 30% discount to fundamental value in years 4 and 7. In this case, note how value in years 0-4 remains the same compared to Exhibit 63, but is depressed subsequently (as expected).

Exhibit 64: NonSuch Gold Ltd share price/value with new equity raised at a 30% discount in years 4 and 7



Source: Edison Investment Research

Both the considerations above have consequences for returns that equity investors may expect. In general, both inflate the returns available from Year 0 to Year 3, but deflate them to any point thereafter. These have not been taken into account in the following discussion of returns, on the basis that share price discounts at the point of equity fund raising are dependent on a number of factors prevailing in the market at the time of the issue, both relating to and independent from the companies themselves. As such, a wide range of discounts, from large to (in some cases) premium prices, exists. In real life, each company must be judged on its merits and within the context of market sentiment at the time it needs to raise funds, in order to determine the appropriate discount. Nevertheless, both are factors of which investors should be aware.

Investment returns

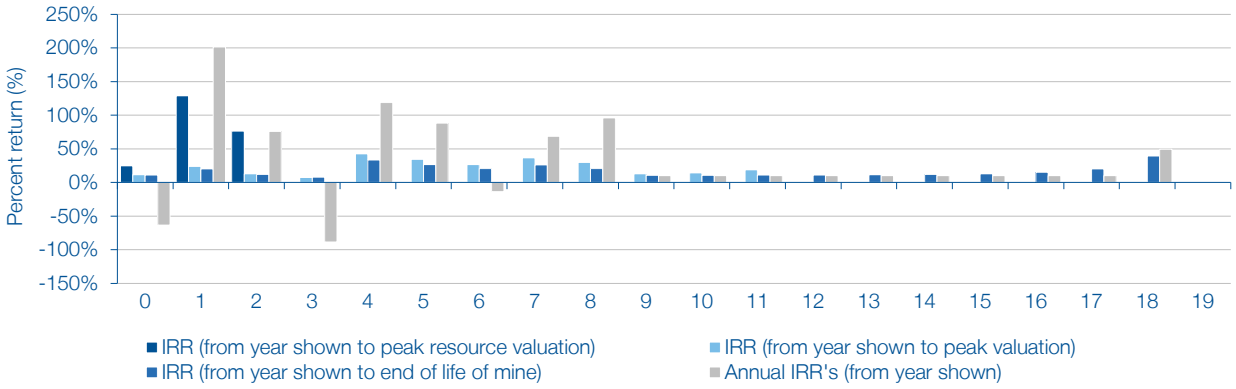
Having established NonSuch Gold Ltd's share price at each stage of its evolution, it is then possible to calculate (total) returns to investors holding the shares. In this case, the three components of potential returns considered are capital, income and terminal value (the latter, given that the company finishes as a cash shell with an 'inferred' resource).

In the case of NonSuch Gold Ltd, four investment strategies are considered:

- Investment in the resource delineation phase only (ie years 0-3).
- Investment to the peak share price (ie years 0-11).
- Investment over the life of the operation (ie years 0-19).
- Annually.

The results of these four analyses may be depicted, graphically, as follows:

Exhibit 65: NonSuch Gold Ltd investor returns via four investment strategies (indicated)



Source: Edison Investment Research

Note that the difference in the value of the two visible bars at Year 18 may be rationalised in terms of the timing of the attainment of terminal value in Year 19 (ie 1 January for the grey bar and 31 December for the blue bar).

Four general conclusions may be drawn from this analysis:

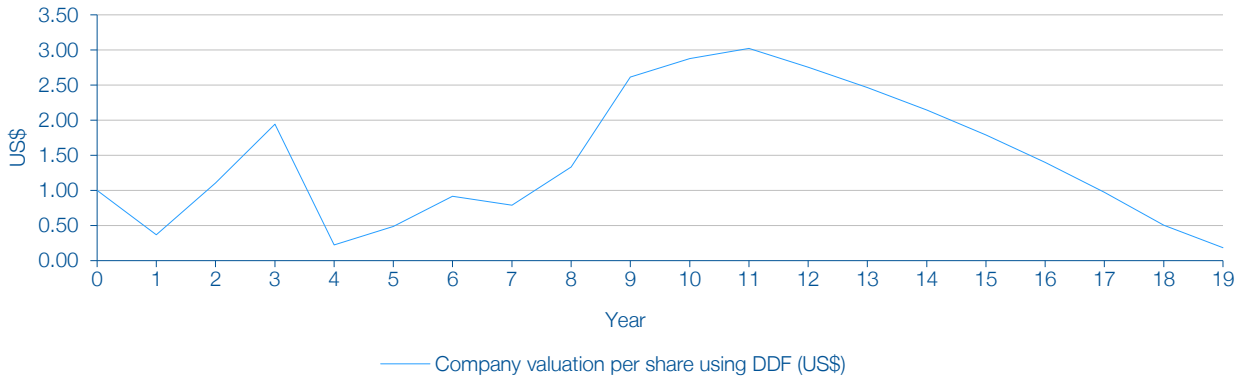
- The best overall returns to investors in NonSuch Gold Ltd occur as it negotiates the transition from explorer to developer (as expected).
- Nevertheless, comparable overall returns may be made during the resource delineation phase of NonSuch Gold Ltd's existence (especially evolving from 'inferred' only resources to 'indicated and inferred' only resources), but within a potentially shorter period of time (ie annual returns may be higher).
- The third best returns occur at the end of the life of the mine when working capital is unwound (in the case of a miner, typically low-grade stockpiles are processed at near-zero cost) and terminal value is realised in the form of terminal cash (in addition to the residual 'inferred' resource).
- Three points of value destruction exist: the initial conversion of cash into an 'inferred' resource (although note this would not be the case for an Australian-listed company), the shift from a resource to a scoping study and the final, major round of equity fund raising in Year 7 (compared to the share price in Year 6).

Some observations on the limitations of the capital asset pricing model (CAPM)

Some observations on the limitations of the capital asset pricing model (CAPM) and its potential limitations in the analysis of junior mining exploration companies looking to become producers are examined below in the light of the results of the NonSuch Gold Ltd analysis.

Consider the share price profile of NonSuch Gold Ltd, as previously described (ie Exhibit 60) and shown below.

Exhibit 66: NonSuch Gold Ltd share price, by year/stage of development



Source: Edison Investment Research

To the end of the life of operations, the total internal rate of return for shareholders from Year 4 (scoping study) is 33.6%, whereas from Year 8 (ramp-up), it is 26.2%, as previously described (see Exhibit 65). Edison asserts that the (risk-adjusted) share prices in years 4 and 8 are 'correct' and that the rationalisation of the disparity in returns relates to the market's pricing of early-stage scoping study risk compared to post-financing ramp-up and execution risk. On this basis, the correct, risk-adjusted cost of equity for a company at scoping study stage should be 33.6%, whereas it should be 26.2% for a company in ramp-up (recall that the cost of debt was set at 11%).

By contrast, using the capital asset pricing model methodology, the conventional derivation of the cost of equity would be according to the equation:

$$\text{Cost of equity} = \text{Risk-free rate} + \beta \times \text{ERP}$$

Where β is the volatility of the company relative to the market and ERP is the equity risk premium of the market.

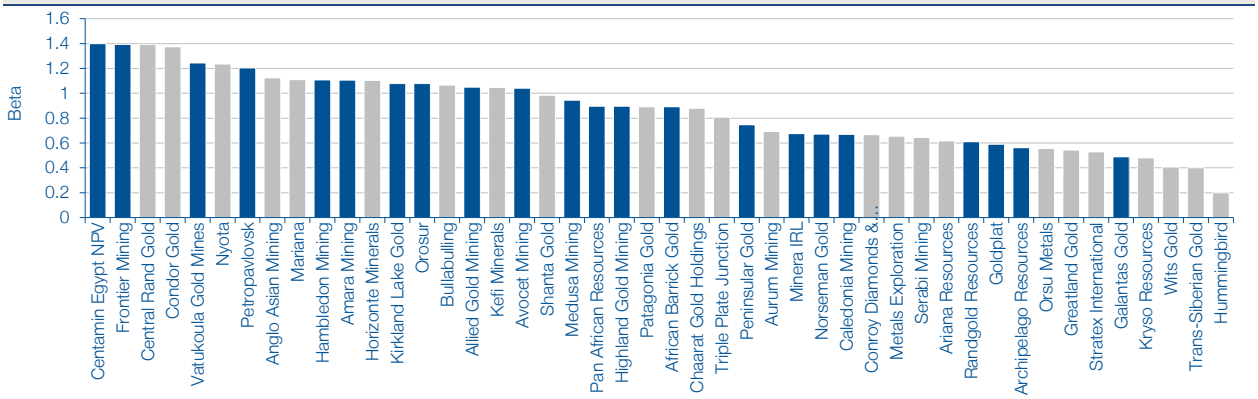
Whatever the market in which a mining company is listed, because its value is typically derived in US dollars, it is justifiable to apply US dollar benchmarks to its valuation. At the time of writing, the 10-year US government bond is yielding 1.8%. Edison estimates that the ERP in the London market is currently of the order of 5.5%.

NB The average equity risk premium for the US in the period 1900-2010 has been estimated by Dimson et al[1] to be 4.4% (versus the UK 3.9% and the world 3.8%).

On this basis, the β required in order to give the 'correct' cost of equity for a scoping study project would be no less than 5 and for a project in the process of ramping-up, no less than 4.

By contrast, an analysis of London-listed mining companies shows an average beta of 0.86 in a range from 0.20 to 1.40 (source: Bloomberg[2]).

Exhibit 67: London-listed mining companies' stock price betas versus FTSE 100 index



Source: Bloomberg, Edison Investment Research

Two features of this graph are noteworthy:

1. The maximum beta of 1.4 for Centamin suggests a maximum cost of equity within the sector of no more than 9.5% – adequate for a profitable, steady-state producer, but (on that basis alone) likely to be inaccurate for a company at any lesser stage of development. NB A beta of 1.4 calculated by Bloomberg[2] implies a 'raw beta' of 1.6 (see footnotes), which suggests a maximum cost of equity of no more than 10.6%, still very far from the risk-adjusted rate implied by Edison's analysis, above.
2. There is very little obvious (inverse) correlation between beta and the stage of a company's development, suggesting that volatility on its own is a poor measure of risk and does not adequately capture the intrinsic risks associated with the stage of development of a company's project.

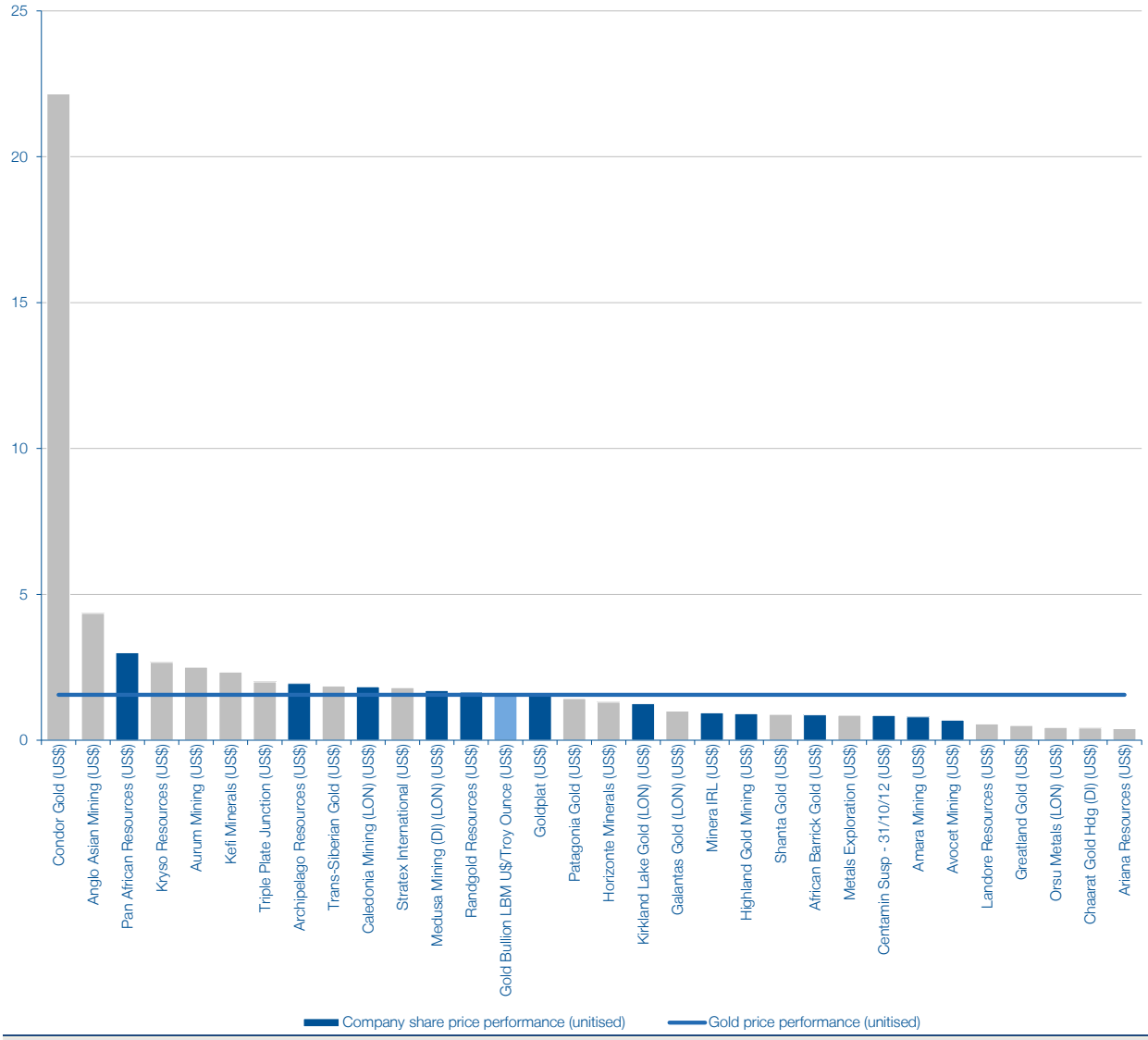
The second point in particular is a variation on a quote by Warren Buffet that "Volatility does not measure risk. The whole concept of volatility is useful for people whose career is teaching, but useless to us." In conclusion, therefore, for a company negotiating the transition from explorer to producer in particular, when 'value' is a dynamic entity, the cost of equity is better captured via the absolute level of a company's share price (based on its stage of development), rather than its volatility around that level.

Actual returns in the marketplace – and consequences for asset allocation

Stated alternatively, NonSuch Gold Ltd's maximum potential return is a factor of 13.72 (ie 1,272%) from a value of US$0.22 per share at scoping study stage to one of US$3.02 per share at its peak valuation in Year 11 (Exhibits 60, 63 and 66).

By contrast, a snapshot of actual returns generated across the gold mining industry – including explorers and producers – between March 2010 and October 2012 is shown below.

Exhibit 68: London-listed gold miners' share price performances in US$, March 2010 to October 2012



Source: Edison Investment Research, Thomson Datastream. Note: Explorers in grey; producers in blue; gold price in light blue.

The average performance over the period was 2.092 (ie an increase of 109.2% in dollar terms over the two-and-a-half year period, with only one company exhibiting a return in excess of one standard deviation from the mean, namely Condor Gold (a factor of 22.154x, or a 2,115.4% increase).

The mean performance of gold equities, in this instance, was 1.624 (ie 62.4%), compared to a return of 1.554 (ie 54.4%) for the gold price, ie an outperformance factor of 1.045 (ie 4.5%). Condor's performance relative to the gold price was a factor of 14.253x, or an outperformance of 1,325.3% (ie comparable to NonSuch Gold Ltd's performance during the transition from explorer to producer).

However, an analysis of actual returns for companies negotiating the exploration to production transition demonstrates an entirely different frequency distribution.

In July 2007, Edison wrote a report entitled *Pay dirt – AIM miners going into production*, which profiled 10 miners "on the cusp of production". Five years later, it is possible to observe the investment returns from such a strategy, which are summarised in the table below.

Exhibit 69: Profiled pay dirt companies' actual investment returns (capital only), July 2007 to October 2012

Company name	Market cap as at July 2007 (£m)	Price in July 2007 (US cents)	Current price (US cents)	Performance in US$ (%)	Performance in £ (%)	Comment
Angel Mining	24.4	35.5	1.6	(95.6)	(94.4)	Ability to raise funds compromised in 2009 financial crisis. Refinanced. Debt-equity swap.
Aurum Mining	46.3	195.9	3.8	(98.0)	(97.5)	Kyrgyz Republic legal challenge to ownership of flagship asset (Andash); currently focused on gold and tungsten in Spain.
Caledon	56	73.7	181.0	145.7	208.5	Taken over by Guangdong Rising Asset Management for 112p a share in cash.
Cambridge Mineral Resources	10.1	9.3	De-listed	(100.0)	(100.0)	Failed to deliver into hedge contracts. Creditor took possession of asset. Delisted. Last trade 0.33p. Latest accounts show £3.2m net assets and 99.9m shares (plus 3.2m subsequently issued).
Coal International	37.3	77.7	86.3	11.1	39.5	Taken over by Cambrian, which was taken over by Western Canadian Coal, which was taken over by Walter Energy.
GMA	47.9	27.4	0.1	(99.6)	(99.5)	Production ramp-up curtailed by operating difficulties in Algeria. Interest in asset sold. Cash shell.
Medusa	65.4	106.6	629.1	490.4	641.4	Successfully achieved production.
Mercator	50.4	164.4	0.7	(99.6)	(99.5)	Cost pressures, ore hardness, bureaucratic delays and localised cracking in pit conspired to put Australian subsidiary into administration; London-listed entity renamed ECR.
Serabi	50.5	92.3	13.3	(85.6)	(81.9)	Grade control variability and equipment delivery delays hit production and force restructuring requiring new capital.
ZincOx	174.3	723.6	92.1	(87.3)	(84.0)	Share price fell in 2008 amid need for alternative funding, causing project delays.
Simple average				**(1.8)**	**23.3**	
Standard deviation				**180.4**	**226.5**	

Source: Edison Investment Research

Several features of the 10 companies' share price performances are immediately apparent:

- The share prices of seven of the 10 companies profiled declined by more than 80% (in both USD and GBP terms); the share prices of only three companies rose, namely Coal International (+11.1%), Caledon (+145.7%) and Medusa (+490.4%).
- The extent of the gain for Medusa (+641.4% in GBP terms) seems to support the findings of the NonSuch Gold Ltd analysis, ie successfully negotiating the transition from explorer to producer exposes investors to returns of many multiples of their original investment and potentially in excess of 10 times. The obvious proviso is that not all companies achieve this transition uneventfully.

- US$10 invested in each stock equally in July 2007 (ie US$1.00 per stock) would have returned US$9.816 in October 2012.
- The unweighted performance of the portfolio of -1.8% equates to an annualised return of -0.4% per annum every year for five years.
- If weighted by market capitalisation, the portfolio would have returned 6.1% over the period in US dollar terms, or 1.2% per annum.
- Over the same period, the gold price rose by 167.1%, or the equivalent of 21.7% per annum for five years, from US$650/oz to US$1,730/oz at the time of writing.
- In sterling terms, the unweighted portfolio performance of 23.3% over five years equates to 4.3% pa. The weighted average portfolio performance was 33.3%, or 5.9% pa equivalent.
- The outperformance of the portfolio in sterling terms compared to US dollar terms merely reflects the decline in the value of sterling from US$2.0296/£ in 2007 to US$1.6162/£ in 2012. In sterling terms, the price of gold has risen 235.4% (the equivalent of 35.3% pa), from £320/oz in 2007 to £1,074/oz at the time of writing.

In addition, it is immediately apparent that the range of potential returns does not in any way approximate a 'normal' or Gaussian distribution. Nevertheless, considered as a portfolio, the returns are not unfavourable relative to those achieved elsewhere in the sector, having outperformed three out of six mining indices from around the world over the same period (in US dollars). It also outperformed both main board UK stock market indices.

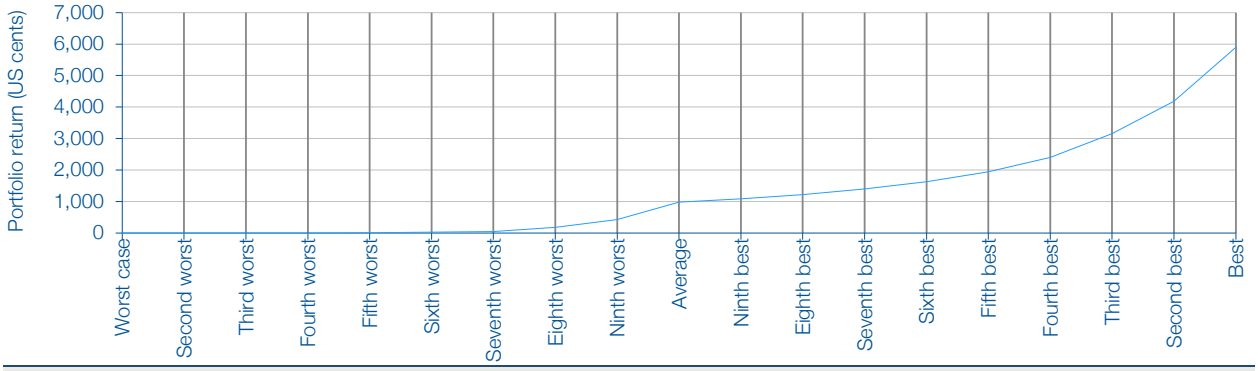
Exhibit 70: Edison portfolio index versus eight other mining and general equity indices, performance

Index	July 2007	Current	Performance (%)	Annualised performance (%)
NYSE Arca Gold BUGS index	345.0	513.8	48.9	8.3
FTSE Gold Mines index	2,387.7	3,310.7	38.7	6.8
S&P/TSX Composite Metals & Mining index	3,073.3	3,636.1	18.3	3.4
Edison unweighted portfolio (above)			**(1.8)**	**(0.4)**
S&P/ASX 300 Metals & Mining index	4,027.5	3,558.9	(11.6)	(2.4)
FTSE All-Share index	6,697.0	4,844.1	(27.7)	(6.3)
FTSE 100 index	12,949.8	9,275.2	(28.4)	(6.5)
FTSE 350 Mining index	41,281.5	29,127.0	(29.4)	(6.7)
FTSE All-Share Mining index	39,919.2	28,059.8	(29.7)	(6.8)

Source: Bloomberg, Edison Investment Research. Note: October 2012.

In considering a portfolio of the above 10 stocks, self-evidently the best performance would be obtained by investing 100% of the portfolio in the top performing stock (Medusa), while the worst performance would be obtained by investing 100% of the portfolio in the worst performing stock. Simplistically, US$10 invested in the top performing stock would have returned $59.04 after five years; US$10 invested in the worst performing stock would have returned US$0 (in listed entity terms) over the same timeframe (versus a portfolio average of US$9.816). Every possible portfolio performance between these two is then available to investors as a result of varying asset allocation within the portfolio. For the above portfolio (in US dollars) the range of returns from a US$10 initial investment may be represented graphically as shown below.

Exhibit 71: Pay dirt portfolio (unweighted) range of potential returns from US$10 initial investment, 2007-12 (US cents), by portfolio type



Source: Edison Investment Research

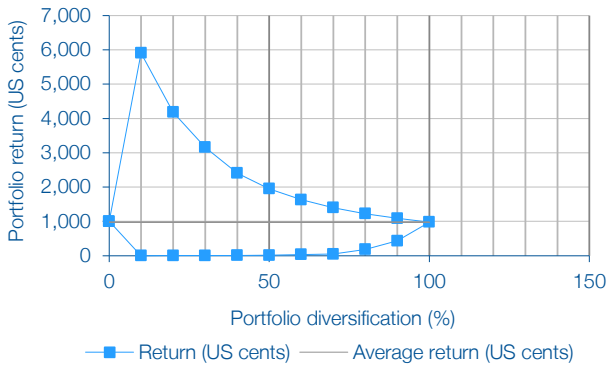
Note that, over the same period, US$10 invested in generic US government bonds would have returned US$12.79; US$10 invested in gold would have returned US$26.71 and US$10 invested in FTSE All-Share Mining index would have returned US$7.03.

This analysis may be further developed by considering asset allocation in terms of either:

- Portfolio diversification (eg all of the portfolio equally invested in 10 stocks equals 100% diversification; all of the portfolio invested in one stock equals 10% diversification).
- Portfolio concentration (eg all of the portfolio in one stock equals 100% concentration; all of the portfolio in 10 stocks equals 10% concentration). Note that, in this case, portfolio concentration may be regarded as a measure of risk.

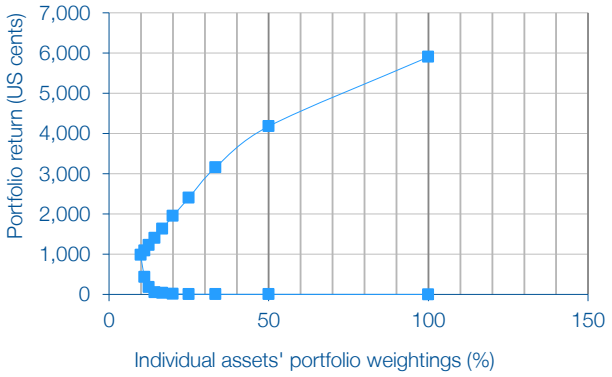
Depicting them in terms of either portfolio diversification or portfolio concentration, the range of returns shown in Exhibit 71, above, is shown below.

Exhibit 72: Pay dirt portfolio (unweighted) range of potential returns from US$10 initial investment, 2007-12 (US cents) versus portfolio diversification



Source: Edison Investment Research

Exhibit 73: Pay dirt portfolio (unweighted) range of potential returns from US$10 initial investment, 2007-12 (US cents) versus portfolio concentration



Source: Edison Investment Research

Note that these graphs are identical, apart from the fact that the x-axis of the one is (effectively) the inverse of the other.

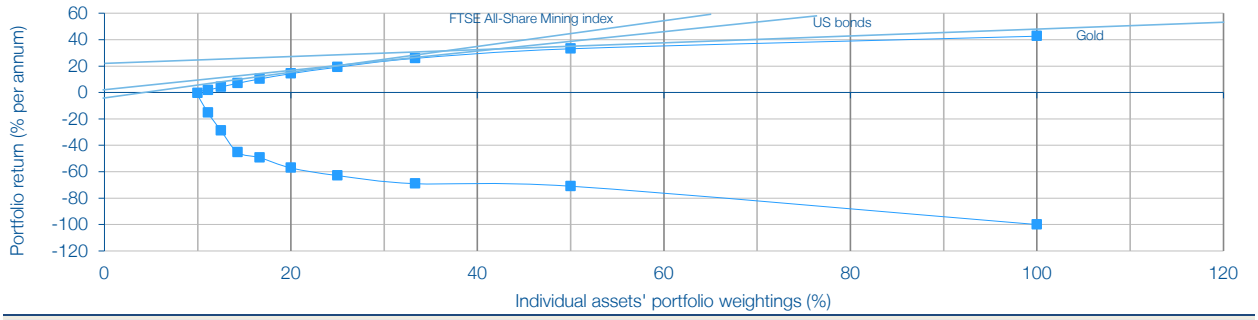
The right-hand depiction of the two is the more conventional representation of the relationship between risk and return and mimics the 'Markowitz bullet' of modern portfolio theory (MPT), albeit in this case 'risk' is defined in terms of portfolio concentration, rather than the more conventional standard deviation of returns. However, as noted above, because the distribution of returns within the portfolio is not 'normal', the shape described by the right-hand curve is heavily skewed.

In this case, MPT may be adapted to the specific 'explorer to producer' portfolio in one of three ways, depending upon whether investors regard the risk-free rate as being best represented by:

- the gold price;
- generic US on-the-run government bill/note/bond indices; or
- an equity index (in this case the FTSE All-Share Mining index).

All three are shown in Exhibit 74, below, relative to the portfolio's annualised returns.

Exhibit 74: Range of returns available from 'explorer to producer' portfolio and three 'risk-free' assets



Source: Edison Investment Research

Note that the introduction of the risk-free asset as a possible component of the portfolio improves the range of risk-expected return combinations available, because everywhere except at the 'tangency portfolio', the half-line gives a higher expected return than the curve at every possible risk level (as predicted by conventional MPT).

However, very much at odds with conventional MPT is the point at which the 'tangency portfolio' occurs, because of the skewedness of the returns observed.

Depending on which instrument is regarded as 'risk-free', returns are possible along any one of the straight lines depicted.

- In the instance in which gold is regarded as the risk-free asset, the tangency portfolio occurs at a portfolio concentration of 50% or 100%, ie just one or two stocks held. This investment style may be regarded as 'picking winners'.
- In the instance in which generic US on-the-run government bill/note/bond indices are regarded as the risk-free asset, the tangency portfolio occurs at a portfolio concentration of 50% or (possibly) 33%, ie just two or three stocks held.
- In the instance in which the FTSE All-Share Mining index is regarded as the risk-free asset, the tangency portfolio occurs at a portfolio concentration of 33%, ie three stocks held.

However, an alternative interpretation is possible in the event that no risk-free asset is available. This might be appropriate for a fund that specialises in investing in mining stocks, for example.

Imagine that an investor has equal holdings in eight out of a possible 10 stocks in the portfolio (ie portfolio diversification of 80% in Exhibit 72 or portfolio concentration of 12.5% in Exhibits 73 and 74). At each point on each graph, the average return will be US$9.816. In moving from 80% portfolio concentration to 70%, however, the maximum potential return increases by US$1.75, whereas the minimum potential return decreases by only US$1.32, ie the maximum potential return is increased by more than the minimum return is decreased with an unchanged average. Thus a rational investor would alter their portfolio concentration from 80% to 70%. In considering an adjustment from 80% to 90% portfolio concentration, the minimum potential return would be increased by US$2.52, while the maximum potential return would be decreased by only US$1.35, for the same average return. Hence, a rational investor would also adjust their portfolio concentration from 80% to 90%. The same logic would then propel 90% portfolio concentration to 100%. It would also propel 70% to 60%, 60% to 50%, 50% to 40% etc until, finally, it would propel 20% portfolio concentration to 10%. Logically therefore, a specialist portfolio of mining stocks (and especially one focusing on companies making the transition from explorer to producer) would either

be fully concentrated (unlikely) or fully diversified (likely). Note that because the frequency distribution of returns is so skewed, this is neither the curve nor the outcome conventionally observed for other sectors/markets, which would typically imply an efficient risk-adjusted portfolio concentration that would provide a return close to the mode of the sample/population.

Conclusions relating to asset allocation in the real world

Asset allocation within a portfolio of mining companies negotiating the transition between explorer and producer will depend on an investor's attitude to risk, as follows:

- On the basis of past returns, those investors looking to outperform the gold price will need to construct a highly concentrated portfolio of 'explorer to producer' stocks, eg one or two stocks out of a choice of 10. This strategy might be described as 'picking winners'.
- Those investors looking to outperform generic US on-the-run government bill/note/bond indices will need to construct a portfolio that is two or three times more diversified, eg two or three stocks out of a choice of 10.
- Those investors looking to outperform the FTSE All-Share Mining index should construct a portfolio of three stocks (out of 10).
- Specialist investors looking to maximise their risk-adjusted returns within the portfolio, without reference to a risk-free asset, should construct a fully diversified portfolio of companies. This strategy might be described as 'diluting losers'.

Part II

Gold – three theories

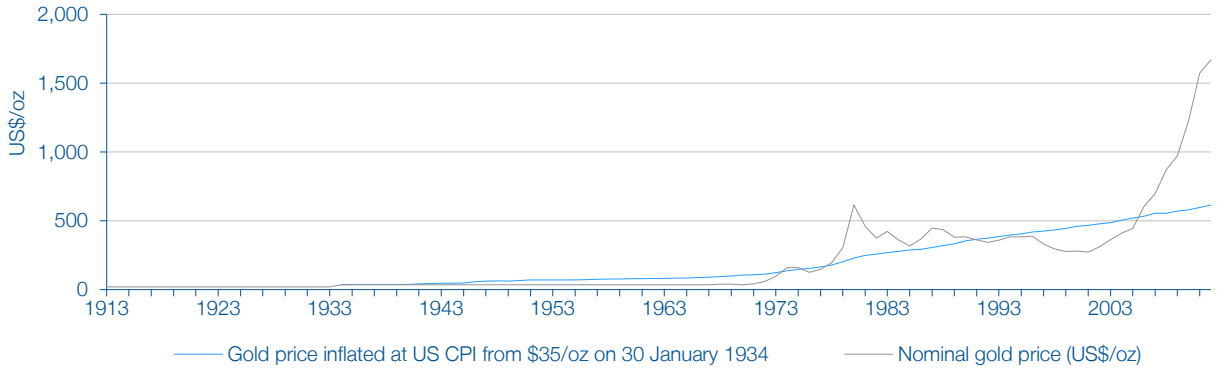
In our April 2009 report, *Gold – a return to the 1970s*, Edison posited a theory that if gold repeats the same performance in the current cycle as it did during the 1970s regarding inflation, it would hit US$1,567/oz "in the near term".

In a follow-up report in October 2009, we argued that, with the world economy still facing deflationary forces, gold's peak would be delayed to 2013, but it would be correspondingly higher at US$1,879/oz. This conclusion was maintained in Edison's third report on the gold market, *Gold – Valuation benchmarks are obsolete* published in January 2010 and will be referred to as the 'Standard theory' from now on in this report.

The Standard theory

According to the Standard theory, the price of gold may be predicted in terms of its divergence from the indexed price, first set at US$35/oz by the Roosevelt administration in January 1934.

Exhibit 75: Actual gold price (1913-2011) versus 1934 indexed gold price (1934-2011), US$/oz



Source: Edison Investment Research, South African Chamber of Mines, US Department of Labor

Between 1945 and 1971, the gold price was inextricably linked to the US dollar. Towards the end of this period however, the US began both to run twin deficits and expand the money supply. As a result, international creditors (and particularly France) began to sterilise dollar foreign exchange reserves into gold, which put upward pressure on the price of gold and downward pressure on the dollar. After a series of initiatives aimed at preserving the Bretton Woods order, President Nixon finally abandoned the link in 1971 (described in some quarters as 'the greatest default in world history').

The subsequent devaluation of the dollar had the effect of importing inflation into the United States, which jumped from a containable 3.4% in 1972 to a virtually unprecedented (as far as the peacetime economy was concerned) 8.7% in 1973. The Federal Reserve reacted to this conventionally, by tightening monetary policy, which burst the credit bubble of the internal US economy and began to suck markets into a debilitating debt-deflation spiral in 1973-74. During this period, the Dow Jones Industrials average lost 45% of its value, while the US economy slowed from 7.2% real GDP growth in 1972 to a 2.1% contraction in 1974. Now facing the prospect of a depression, the world's authorities reacted conventionally, by reducing interest rates to a minimum and by expanding the US monetary base. Inevitably, this put further downward pressure on the value of the dollar and imported price rises, leading to a second peak in inflation later in 1979, which was only brought under control at the expense of a further debilitating domestic recession in the US (and UK) in the early 1980s, after Paul Volcker's decision to raise interest rates in order to

defend the value of the dollar in international foreign exchange markets. Positive interest rates having once again been re-imposed in the US, international markets returned to something approaching normality, albeit with the dollar (and, to some extent, sterling) at permanently lower levels compared to the currencies of international creditor nations such as Germany, France and Japan.

Exhibit 76: Creditor nation currencies versus US$, 1971-80

Currency	1971	1980	Change (%)
Deutsche Mark	3.27	1.97	+66%
Japanese yen	315	203	+55%
French franc	5.52	4.04	+37%

Source: Edison Investment Research, Bloomberg

As positive real interest rates reasserted themselves in 1980, so currency markets stabilised and gold returned to a bear market phase (analogous to the period of 1945-68), which lasted until 2001. Hence, whereas the German mark had appreciated by 66% during the 1970s, in 1999 the DEM/US$ rate was almost the same as it had been in 1980.

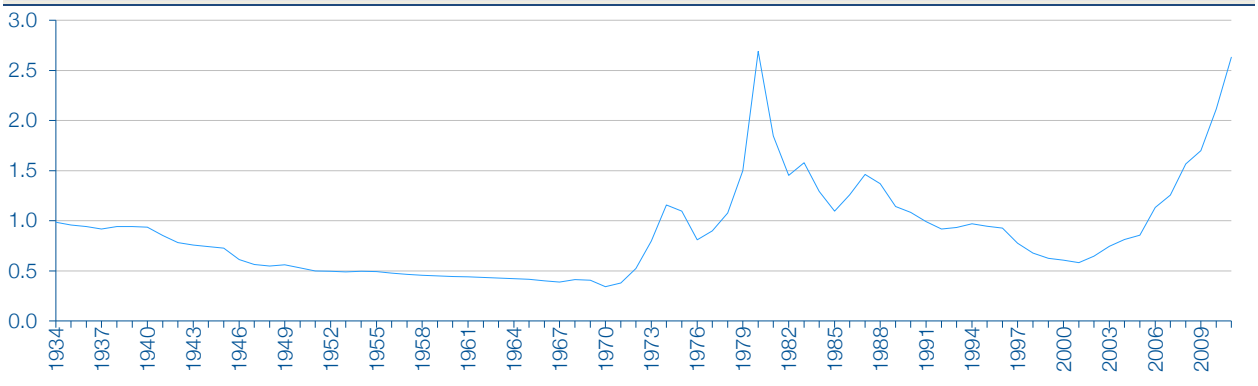
However, as the new millennium dawned (and after a period of relative economic stability), the US once again began to run twin deficits as a result of a combination of the War on Terror and the rise of a new economic competitor in the form of China, which resulted in:

- a return of negative real interest rates in 2001;
- inflation and a subsequent rise in interest rates in 2007;
- banking failures and the beginnings of a debt-deflation spiral in 2007-08 (Bear Stearns, Northern Rock, Lehman Brothers etc); and
- unconventional monetary policy, ie QE1, QE2 and QE3 intermittently from 2008 to the present.

Gold's two bull and two bear markets since 1945 may be easily observed by studying the extent of its divergence from its 1934 indexed level, as follows, showing:

- A bear market between 1945 and 1967 (a period that was characterised by inflation and positive real interest rates).
- A bull market phase between 1968 and 1980 (a period of negative real interest rates).
- A bear market phase from1980 to 2001 (positive real interest rates).
- A bull market again from 2001 to the present (negative real interest rates) as shown below.

Exhibit 77: Actual gold price divergence from indexed 1934 price (factor)

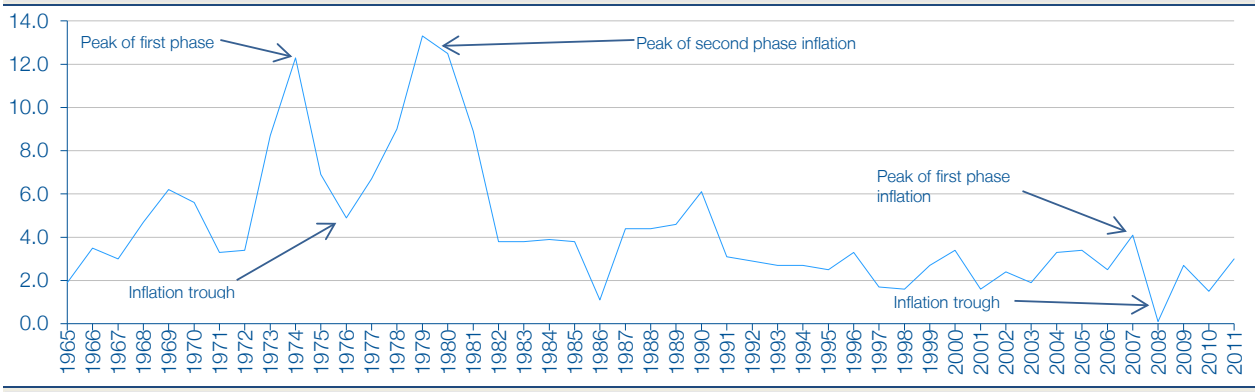


Source: Edison Investment Research, South African Chamber of Mines, US Department of Labor

The Standard theory also observes that the crisis of the 1970s proceeded in two distinct phases. In the first, burgeoning inflation (catalysed by twin US deficits) was combated by the authorities with monetary tightening, which conspired to suck financial markets into a debilitating debt-deflation spiral in 1973-74. During this period, the Dow Jones Industrials Average lost 45% of its value, while the US economy slowed from 7.2% real GDP growth in 1972 to a 2.1% contraction in 1974. In the

face of a new crisis, the world's authorities then reacted by adopting an excessively stimulative monetary policy to counteract the resulting recession and thereby created a distinctive second peak in inflation later in the decade, in 1979 (see Exhibit 78).

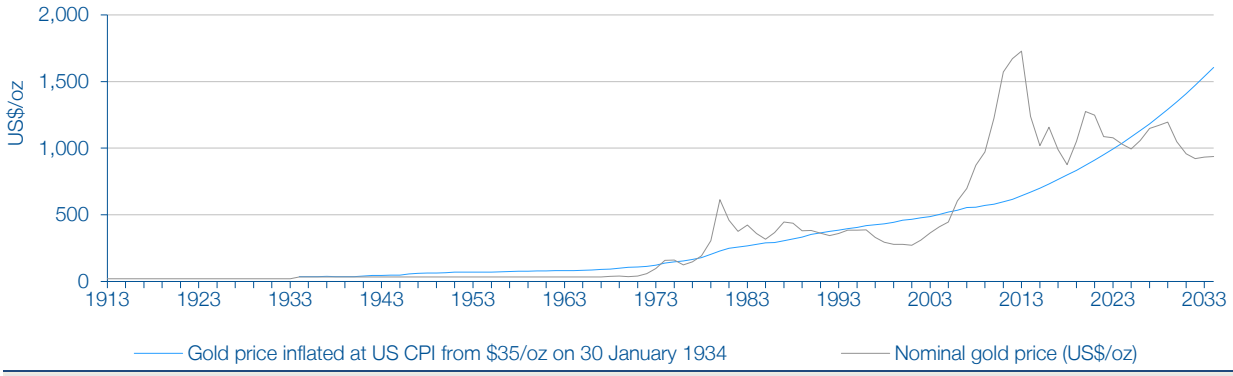
Exhibit 78: US consumer price index, change year-on-year, 1965-2011 (%)



Source: US Department of Labor

Occurring three years after the first peak, the peak of second-phase inflation (in 1979) accurately demonstrated Alan Greenspan's assertion that it takes approximately three-and-a-half years for the effects of quantitative easing to become apparent in inflationary statistics (*Financial Times*, 26 June 2009). If 2008/9 represented the trough in inflation in the current cycle, then on the basis of a similar timespan, it is likely that the peak of second-phase inflation will prove to have been in 2012 and that the gold price will peak one year after that in 2013, as shown in the (updated) graph below.

Exhibit 79: Historic and forecast gold prices according to the Standard theory (US$/oz), 1913-2034



Source: Edison Investment Research, South African Chamber of Mines, US Department of Labor. Note: Prices are annual averages.

Having averaged approximately US$1,659/oz so far in 2012, the gold price will average approximately US$1,670/oz for the full year if it maintains its current level for the remainder of the year. Assuming the same nominal:indexed premium in 2013 as in 1980 (see Exhibit 77), the gold price will then rise 3% to average US$1,727/oz in 2013, before falling back to trade in the range US$850-1,300/oz for the following 21 years.

Potential problems with the Standard theory

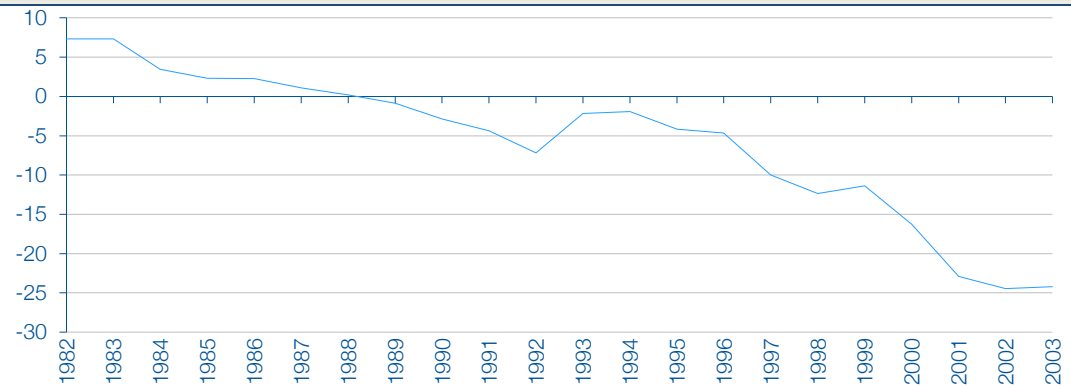
Six interconnected problems exist with the Standard theory to suggest that history will not repeat itself in 2013, exactly as it did in 1980. These are treated separately, as follows:

1. The US's status as net creditor or debtor

Whereas the US was the world's largest creditor nation entering the 1970s, it attained debtor nation status (with direct investments valued at market rates) in 1989 for the first time since (probably) the 1914-18 war. After two decades of subsequent, continued current account deficits, it is now the

world's largest debtor nation, with an external deficit amounting to US$4.0trn, or 26.3% of GDP. The evolution of this deficit is shown in Exhibit 80.

Exhibit 80: US net international investment position as a percentage of GDP (%), 1982-2003



Source: Edison Investment Research, US Bureau of Economic Analysis

Whereas in 1980, therefore, the United States' status as a creditor nation created an aggregate imperative to protect and defend the value of the US dollar in order to protect the value of invested capital, in 2012 the environment has changed to one in which the (domestic) US aggregate imperative is to devalue in order to regain competitiveness in international export markets.

Note that an estimated c US$2trn (gross) of the US$4trn US external deficit is held in China.

2. Inflation

Whereas inflation in the 1970s reached a level that required government action (in the form of ultimately futile price controls etc), while elevated relative to the state of the economy, so far in the period 2008-12, price rises have remained at a level that has not yet become a political issue. Several theories have been advanced to explain this, including:

- A reduction in the power of the unions – in the 1970s strong unions were able to force above-inflation pay settlements, which initially threatened to convert a spike in inflation into an inflationary spiral.
- Western economies that are less oil-intense.
- Inaccurate reporting of inflation data.

Whatever the reason, the relatively moderate inflation data mean there is less pressure from international creditors to raise interest rates in order to protect the real value of their investment and more acquiescence to the need to stimulate the domestic US economy.

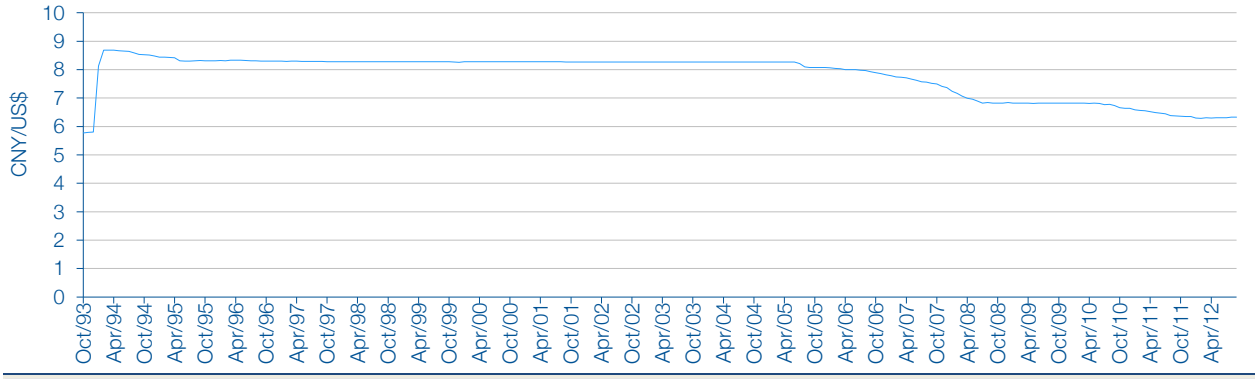
3. Interest rates

In the light of the two preceding points and given that it was Paul Volcker's decision in 1980 (under domestic political pressure) to raise interest rates in order to defend the value of the dollar that abruptly terminated gold's bull run in the 1970s, the absence of similar, equivalent pressure from either the domestic economy or international creditors in 2012/13, creates the potential for an extended period of dollar weakness and gold price strength.

4. The renminbi

Whereas the currencies of United States' creditors appreciated by between 37% and 66% in the 1970s, to date, the renminbi has appreciated by only 31% compared to the CNY8.27/US$ level at which it was pegged, effectively between May 1995 and June 2005.

Exhibit 81: Graph of the Chinese renminbi versus US$, 1993 to present



Source: Edison Investment Research, oanda.com

Moreover, at its current level of CNY6.3268/US$, the renminbi is trading at a level that is actually still 8% below its rate of CNY5.80/US$ in December 1993.

As a result:

- the external imbalances (and especially US trade deficit with China) that contributed to the global financial crisis in 2008 remain substantially unresolved and, to date, seemingly unresolvable through the medium of foreign exchange rates (unlike in the 1970s, when the dollar fundamentally and effectively irreversibly declined in value – see Exhibit 76, above).
- the US has imported relatively less inflation from China than would otherwise have been the case (NB This then contributes to the first point on inflation).

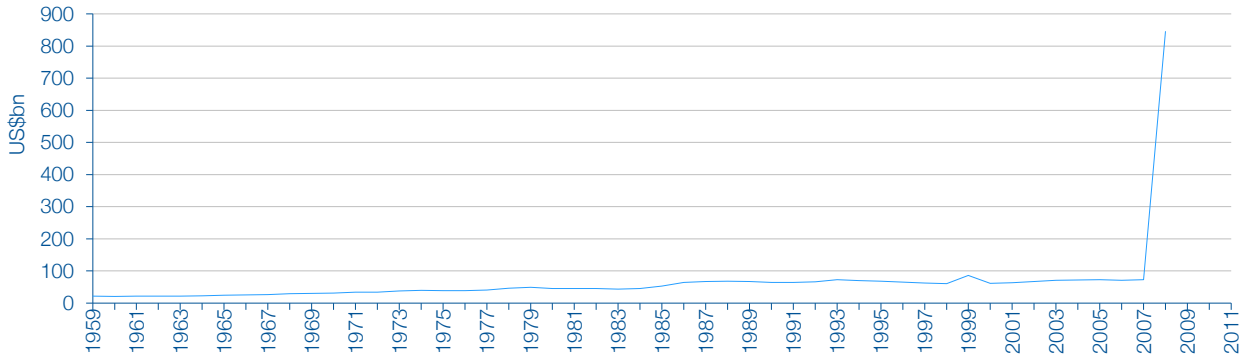
5. Scale – billions

An additional difference from the 1970s is the scale of the situation with respect to the populations involved. In the 1970s, the number of countries operating in the free-market system was relatively small – effectively, the anglophone world plus continental Western Europe and Japan. In terms of the economic imbalances, the incumbent economic powers (principally the US, UK, Australia, Canada and New Zealand) with a combined population of some 298m (source: the CIA) was being challenged by Japan and a resurgent continental Western Europe (principally Germany and France) with a combined population of 233m. Today, the incumbent economic powers (principally, the US, EU and Japan) with a combined population of c 825m is being challenged by emerging economies with a population in China alone of 1,347m. With the collapse of the Soviet Union and the re-introduction of the former Communist block into the free market economy, all told, the population of those countries seeking to compete with the incumbent powers is 6,222m.

6. Scale – trillions

The effect of imbalances between populations measured in billions inevitably gives rise to imbalances between economies measured in trillions. This is most apparent in a study of the firepower deployed by the Federal Reserve in the form of reserve bank cash (ie deposits by commercial banks held at the Federal Reserve, which, together with currency in circulation, comprise a country's monetary base). In the case of the recent crisis, the Federal Reserve has increased reserve bank cash by a large amount, not only in absolute terms, but also in historical terms.

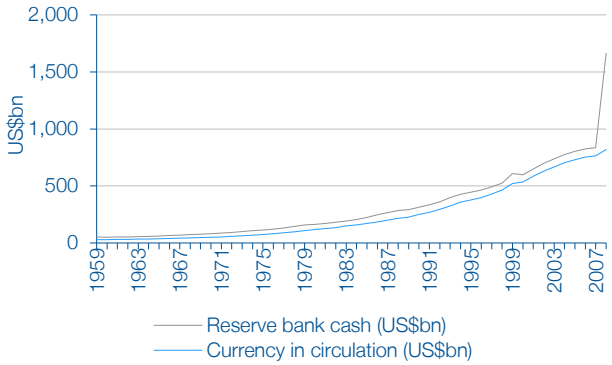
Exhibit 82: US reserve bank cash, year end, 1959-2008 (US$bn)



Source: Edison Investment Research, dollardaze.org

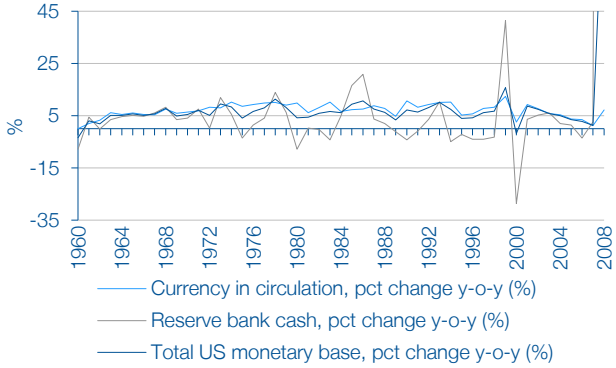
While reserve bank cash has historically been a relatively volatile entity, the increase since 2007 is nevertheless without precedent (at least since 1960). Moreover, whatever its volatility, it has traditionally been deployed in such a way as to maintain a relatively predictable growth in the monetary base, as shown below:

Exhibit 83: Total US monetary base comprising reserve bank cash and currency in circulation, 1959-2008



Source: Edison Investment Research, dollardaze.org

Exhibit 84: Change in reserve bank cash, currency in circulation and total US monetary base, 1960-2008 (%)



Source: Edison Investment Research, dollardaze.org

Two features of these exhibits are noteworthy:

- Whereas growth in reserve bank cash became volatile in the 1970s and early 1980s, it never grew by more than 21% in any one year; by contrast, in 2008, reserve bank cash grew by 1,063% compared to 2007.
- While reserve bank cash has declined on many occasions (often, but not always, presaging recessions), the US monetary base has decreased only twice in the 48 years charted (once in 2000 after reserve bank cash was increased in 1999, as a pre-emptive measure against a potential Y2K crisis and once again in 1960), demonstrating the effective, subsequent monetisation of reserve bank cash changes.

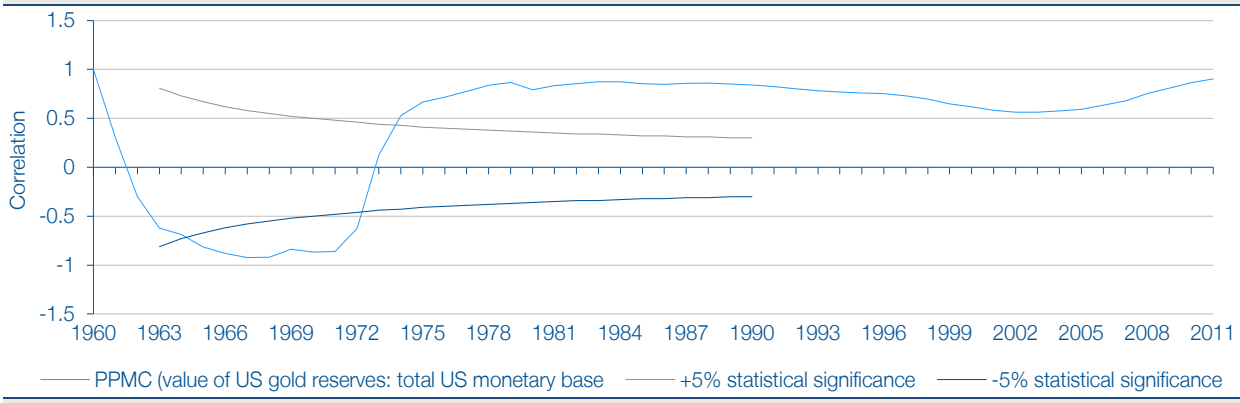
The Revised (and Edison's preferred) theory

In light of the above concerns regarding the Standard theory, the Revised theory is based on the relationship between the gold price and the total US monetary base and now forms the basis of Edison's long-term expectations for the gold price.

Under the gold standard, there was a government mandated relationship between the value of a country's gold reserves (at a fixed price) and its total monetary base. This held true for the United States until 1931 and broadly true from 1945 to around 1952, at the start of the post-World War II international gold-dollar exchange system devised as a result of the Bretton Woods accord. The

relationship broke down from the late 1950s, when outflows of gold from the US coincided with increases in the total monetary base, giving rise to a negative correlation.

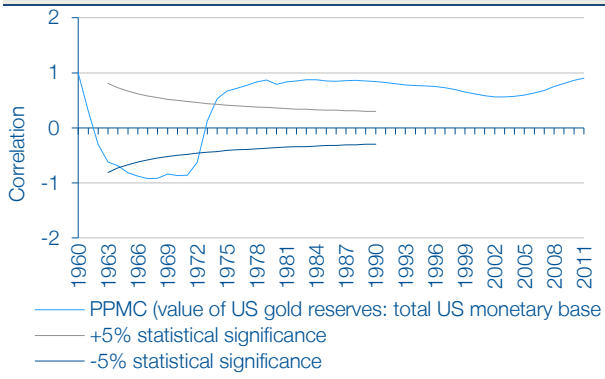
Exhibit 85: Correlation between value of US gold reserves and total US monetary base, 1959-2011



Source: Edison Investment Research, dollardaze.org, Federal Reserve. Note: PPMC = Pearson product-moment coefficient.

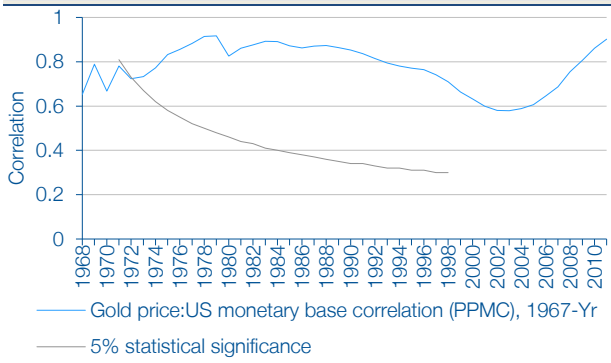
This correlation re-established itself strongly again from the early 1970s, after the dollar-gold peg was broken by Nixon. However, since US gold reserves have been ostensibly static since 1972, it allows investors to posit a direct relationship between the total US monetary base and the gold price. Statistically, this is borne out by the strong Pearson product-moment coefficient of 0.903 generated from a regression analysis between the two, which is said to be statistically significant at the 5% level, given the amount of data involved in the analysis (ie there is less than a 5% chance that the relationship between the two occurred by chance).

Exhibit 86: Correlation between value of US gold reserves and total US monetary base, 1959-2011



Source: Edison Investment Research, dollardaze.org, Federal Reserve; Note: PPMC = Pearson product-moment coefficient.

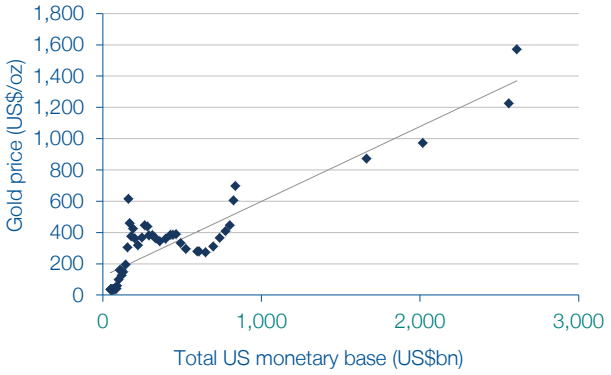
Exhibit 87: Correlation between the price of gold and total US monetary base, 1968-2011



Source: Edison Investment Research, dollardaze.org, Federal Reserve

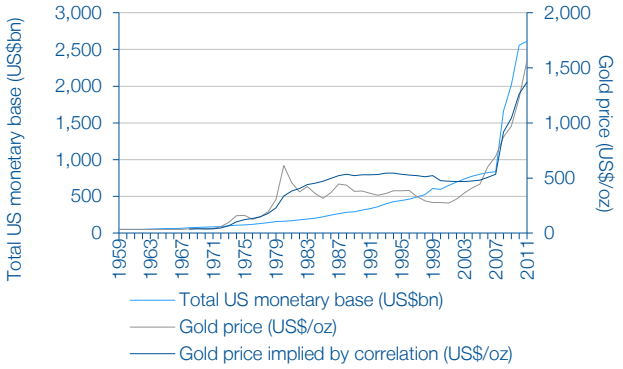
Such an analysis becomes significant at a time when the US monetary base is increasing. To date, the Federal Reserve's QE and QE2 initiatives have increased the total monetary base by c US$1.9trn. According to the Revised theory, these were instrumental in increasing the price of gold from US$534/oz (±US$133/oz in 2007) to US$1,370/oz (±US$133/oz) in 2011, which was the basis of Edison's previous long-term gold price:

Exhibit 88: Gold price versus total US monetary base regression analysis, 1959-2011



Source: Edison Investment Research, dollardaze.org, Federal Reserve

Exhibit 89: Total US monetary base (US$bn) and actual gold price vs gold price implied by relationship (US$/oz)

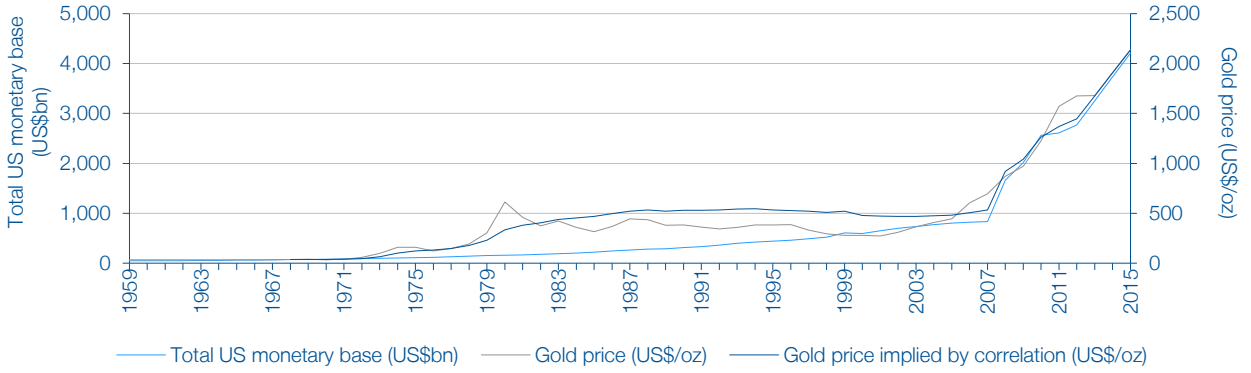


Source: Edison Investment Research, dollardaze.org, Federal Reserve

In the context of a stubbornly high unemployment rate in particular, on 13 September 2012, the chairman of the Federal Reserve, Ben Bernanke, announced that the Federal Reserve will purchase US$40bn of mortgage-backed bonds per month to stimulate the housing market and keep long-term interest rates low. Unlike QE1 and QE2, moreover, he stated that the Federal Reserve would persist with the policy until the outlook for the job market improved "substantially".

Assuming that it will increase by US$40bn per month as a result of QE3 in broadly the same way as it did for QE1 and QE2, the total US monetary base will expand from US$2.6trn (as at end-September) to US$2.8trn by December and US$3.3bn by December 2013 etc. Within the context of its historical relationship with the total monetary base, this implies a gold price of US$1,446/oz as at December 2012, US$1,676/oz as at December 2013 and, if it then continues, US$1,906/oz as at December 2014 and US$2,136/oz as at December 2015, as shown in Exhibit 90.

Exhibit 90: Gold price implied by continuation of QE3 to December 2015 (US$/oz)



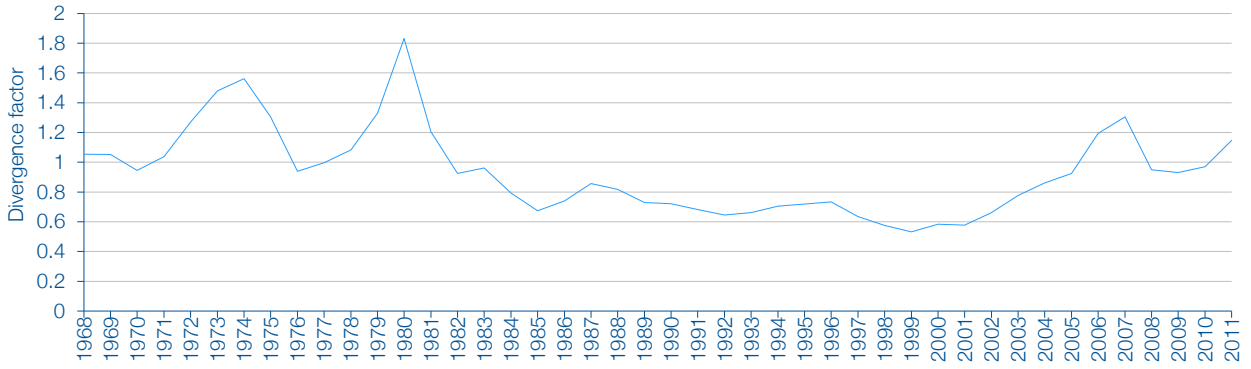
Source: Edison Investment Research, dollardaze.org, Federal Reserve

Alternatively, the rate of increase of the long-term gold price may be stated as US$19/oz for every month of QE3. As such, the current price of gold (c US$1,730/oz) can be perceived as discounting QE3 continuing for 19 months until c May 2014.

Edison's 'base case' assumption is that QE3 will last until around December 2013, adding an additional US$640bn to the total US monetary base (ie comparable to QE2) and implying a long-term price of gold of US$1,676/oz.

Nevertheless, although the current price of gold is c 3% above Edison's long-term price and 20% above the price implied by its estimate of the December 2012 total US monetary base (after four months of QE3), it is worth noting that in the past the gold price has traded (in a bull market/periods of negative real US interest rates) at prices up to an 83% premium to this level, as shown in the graph below.

Exhibit 91: Historic divergence of actual gold price versus gold price implied from total US monetary base relationship



Source: Edison Investment Research, dollardaze.org, Federal Reserve

If the gold price attains the same premium over its implied price in December 2012 as it reached in 1980, it is conceivable that it could reach US$2,649/oz in the relatively short term – a level that would then rise with the subsequent passage of time.

The Alternative theory – the world turned upside down

The Alternative theory was developed by Edison before the announcement of QE3 and, to some extent therefore, has been superseded. Nevertheless, it may be relevant in the event that QE3 is brought to an end 'prematurely'.

Specifically, the Alternative theory posited that the stimulus to the US economy as a result of QE1 (US$1.5trn) and QE2 (US$0.6trn) was insufficient to stimulate the economy to the extent required to create acceptable levels of economic growth and to bring unemployment meaningfully below 8%. The basis of this assertion was that, to date, the stimulus has been small relative to the losses sustained by the US economy, which have been variously estimated to amount to c US$8trn, approximately as shown below.

Exhibit 92: Estimates of losses in the US economy as a result of the global financial crisis

	Change (US$trn)	Comment
Total home equity	(4.2)	House prices down 20% from peak; total home equity of US$13trn in 2006 down to US$8.8trn in mid-2008; consistent with 80m households losing US$50,000 in equity, from $150,000 to US$100,000 each; little subsequent recovery.
Total retirement assets	(2.3)	Americans' second-largest household asset.
Savings (excluding retirement savings)	(1.2)	S&P 500 down 45% between 2007 high and November 2008.
Pension assets	(1.3)	
Total	**(9.0)**	**Americans estimated to have lost a quarter of their wealth between June 2007 and November 2008.**

Source: Edison Investment Research

Commentators estimated at the time that losses to US and European banks as a result of their exposure to 'toxic' assets to be US$1trn and forecast losses of US$2.8trn between January 2007 and September 2009, split approximately US$1trn (US banks) to US$1.6trn (European banks). In 2010, the IMF lowered its forecast of bank losses as a result of the financial crisis to US$2.28trn. As recently as the second half of 2012, the former chief credit officer of S&P estimated total global losses as a result of the crisis to be as much as US$15trn.

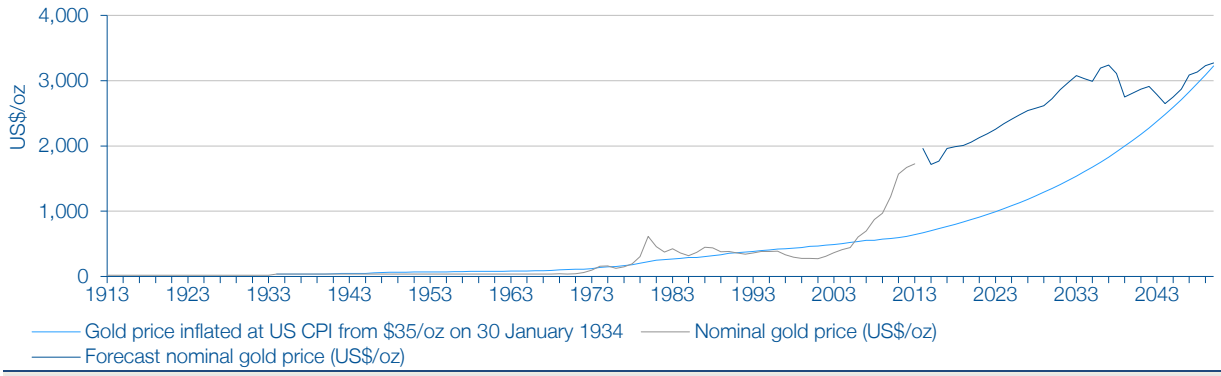
It is beyond the scope of this report to assess the veracity or accuracy of these estimates, except perhaps to observe that in the case of total US home equity – the largest single component of the US losses – the estimate appears to be of the right order of magnitude. However, even if the estimates are wrong by an error of 50%, it can readily be appreciated that they remain large in comparison to the amount of stimulus (US$2.1trn) subsequently deployed by the Federal Reserve

to ameliorate the situation. In fact, one way of looking at the stimulus would be to observe that it roughly makes up the losses suffered in the western world's banking system, but little beyond that in terms of reducing/monetising debt in the real economy. As a result, the domestic economy would be returned to roughly the same state as existed in 2006 before the crisis, but with lower asset prices, lower confidence, lower GDP growth projections, lower demand for credit, a lower inclination by the banks to supply credit and a higher appreciation of the extent of the debt overhang in the real economy generally. As a result, the Alternative theory argued that in the absence of any additional stimulus, there would be little inflationary pressure, but also relatively little GDP potential, which would henceforward depend on innovation and technological advancement alone to grow, rather than expanding monetary aggregates, ie something akin to stagflation.

The one advantage of such a state of affairs is that it would allow interest rates to be maintained at record low levels over a very extended period of time. Therefore, in the light of this, the Alternative theory posited a 21-year period of benign negative/zero real interest rates, during which the supportive effect on the gold price would be the inverse of the depressive effect in the period 1950-70 (deemed a period of benign positive real interest rates).

Under these circumstances, Edison estimates the following future trajectory for the gold price (relative to the same 1934 indexed price, on which the Standard theory is based).

Exhibit 93: Gold price projections, assuming an extended period of benign negative/zero real interest rates



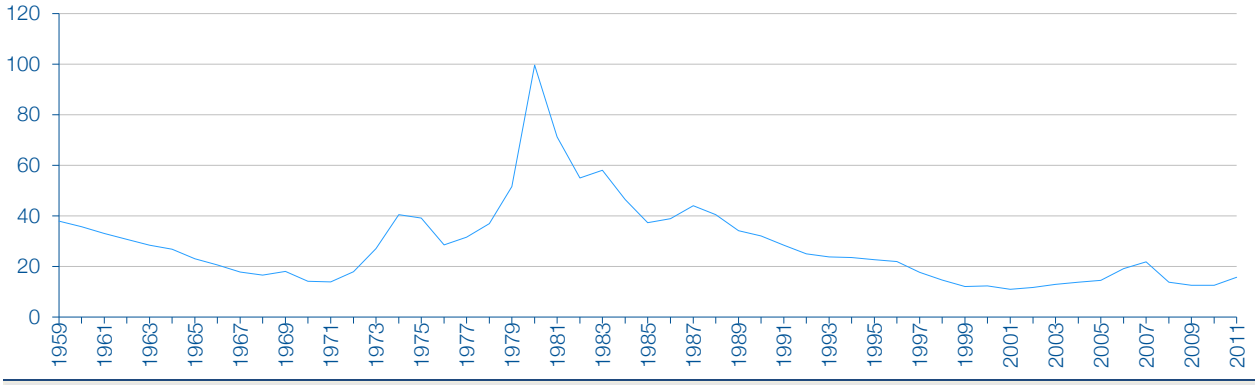
Source: Edison Investment Research, South African Chamber of Mines, US Department of Labor

Note that in this case, the years from 2034 to 2050 (shown in Exhibit 93) equate to an 'inversion' of the period 1934-50 and therefore (effectively) reflect a period of crisis, rather than one of benign economic circumstances. They have nevertheless been included for the sake of completeness.

The *reductio ad absurdum*?

The scenarios above consider a relatively orderly economic future in which the imbalances of the past can be worked out and managed. In particular, the Revised theory (now adopted as Edison's preferred assessment of the future) assumes a continuation of the observed relationship between the gold price and the total US monetary base since 1959. Under these circumstances, the total monetary base will expand to US$3,251bn by the end of 2013 and, according to the Alternative theory, gold will stabilise at a long-term price of US$1,676/oz, in which case the US's 262Moz of official reserves would have a market value of US$438bn and back 13.4% of the total monetary base. As Exhibit 94 (below) shows, this is consistent with recent history (NB the low on this chart – probably the lifetime low in the history of the US – was 11% in 2001).

Exhibit 94: United States' official gold reserves' valuation as a percentage of total US monetary base (at market rates)



Source: Edison Investment Research, dollardaze.org, Federal Reserve

However, it is well below the period's maximum of 99.7% in 1980, which coincidentally implied the full backing of the monetary base with America's stock of gold, in accordance with the established principles of the gold standard. It is also well below the average for the period of 28.4%.

Even today, if America's official stock of gold were required to give full backing to the US$2.6trn total monetary base, the gold price would be required to rise to a level of US$9,904/oz.

If its official stock of gold were instead required to cover the US's net external deficit of US$4.4trn (excluding the value of its gold holdings), the gold price would be required to rise to a level of US$16,942/oz.

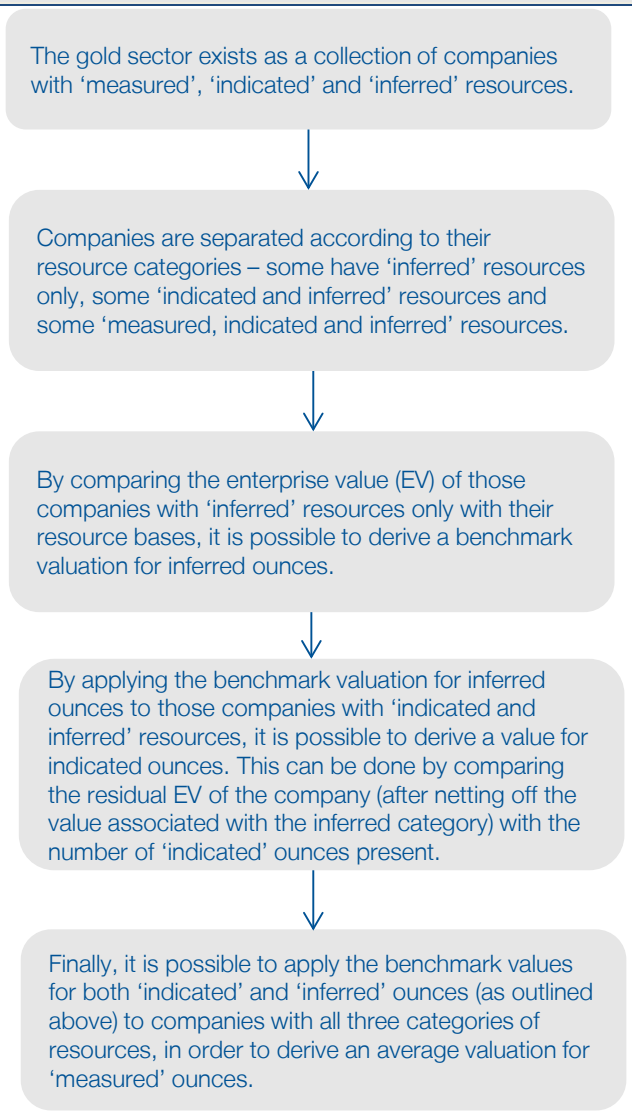
Appendices

The method used to value distinct resource categories

A recap of the methodology used to derive separate valuations for each category of resource ounces is given below.

Under JORC-style reporting standards, resources are sub-divided into three categories, according to the level of confidence and knowledge in their geology. In ascending order, these categories are 'inferred', 'indicated' and 'measured'. While historically these have often been considered together and companies valued with respect to the total number of ounces in their resource bases, there is a considerable degree of difference in the geological confidence attached to each category. The schematic depiction below demonstrates the methodology we have used to determine the differences in the implied valuations of these ounces with respect to their categorisation:

Exhibit 95: Schematic representation of methodology used



Source: Edison Investment Research

Discovery cost estimates

In addition to analysing the value of each category of resource ounces, this report also quotes discovery costs per ounce. This analysis was conducted by BDO in collaboration with Edison Investment Research and was detailed in our report, *Gold – Valuation benchmarks are obsolete* published in January 2010. Included in each of the samples are some companies with only 'inferred' resources and some with just 'indicated' and 'inferred' ounces. By calculating the discovery cost of 'inferred' ounces first and assuming this cost to be the same for all companies with higher resource categories (ie using the same methodology as above for differentiated resource valuations), it is similarly possible to estimate the industry-wide costs of the discovery of 'indicated' ounces and then (by adopting the same methodology) 'measured' ounces.

Exhibit 96: NonSuch Gold Ltd financials

	Exploration				Development					Production										
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
P&L																				
Sales	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**135.0**	**135.0**	**135.0**	**135.0**	**135.0**	**135.0**	**135.0**	**135.0**	**135.0**	**135.0**	**0.0**
Cost of sales	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	0.0
Central, general & administrative costs	0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	0.0
EBITDA	**0**	**(4.0)**	**(4.0)**	**(4.0)**	**(4.0)**	**(4.0)**	**(4.0)**	**(4.0)**	**(4.0)**	**65.0**	**65.0**	**65.0**	**65.0**	**65.0**	**65.0**	**65.0**	**65.0**	**65.0**	**65.0**	**0.0**
Depreciation	0	0.0	0.0	0.0	0.0	0.0	0.0	(2.8)	(7.3)	(9.0)	(9.0)	(9.0)	(9.0)	(9.0)	(9.0)	(9.0)	(9.0)	(9.0)	(9.0)	0.0
Depletion	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	0.0
Amortisation of study investment	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	0.0
EBIT	0	(4.0)	(4.0)	(4.0)	(4.0)	(4.0)	(4.0)	(6.8)	(11.3)	55.9	54.4	54.4	54.4	54.4	54.4	54.4	54.4	54.4	54.4	0.0
Net interest	0	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	(5.1)	(3.8)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Profit before tax	**0**	**(3.8)**	**(3.9)**	**(3.9)**	**(4.0)**	**(3.9)**	**(3.9)**	**(6.7)**	**(11.3)**	**50.7**	**50.6**	**54.4**	**54.4**	**54.4**	**54.4**	**54.4**	**54.4**	**54.4**	**54.4**	**0.0**
Tax	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.2	14.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	0.0
Marginal tax rate	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
Profit after tax	0	(3.8)	(3.9)	(3.9)	(4.0)	(3.9)	(3.9)	(6.7)	(11.3)	36.5	36.4	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	0
Retained earnings	0	(3.8)	(3.9)	(3.9)	(4.0)	(3.9)	(3.9)	(6.7)	(11.3)	36.5	24.3	(10.6)	(10.6)	(10.6)	(10.6)	(10.6)	(10.6)	(10.6)	(10.6)	0
EPS (US$)	**0.00**	**(0.13)**	**(0.13)**	**(0.13)**	**(0.09)**	**(0.09)**	**(0.09)**	**(0.08)**	**(0.13)**	**0.42**	**0.42**	**0.45**	**0.45**	**0.45**	**0.45**	**0.45**	**0.45**	**0.45**	**0.45**	**0.00**
DPS (US$)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.14**	**0.57**	**0.57**	**0.57**	**0.57**	**0.57**	**0.57**	**0.57**	**0.57**	**0.00**
PER	**N/A**	**(7.9)**	**(9.7)**	**(12.4)**	**(3.3)**	**(6.2)**	**(10.7)**	**(10.8)**	**(10.7)**	**6.4**	**7.0**	**6.8**	**6.3**	**5.6**	**4.9**	**4.1**	**3.2**	**2.3**	**1.2**	**N/A**
Yield (%)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**4.8**	**18.6**	**20.3**	**22.7**	**26.0**	**31.0**	**39.3**	**55.9**	**103.7**	**0.0**
B/S																				
Non-current assets																				
Property, plant & equipment	0	0.0	0.0	0.0	0.0	0.0	0.0	30.6	73.2	80.9	71.9	62.9	53.9	44.9	36.0	27.0	18.0	9.0	0.0	0.0
Mineral exploration	0	9.1	10.8	18.6	18.6	18.6	18.6	18.6	18.6	18.6	17.1	15.7	14.2	12.8	11.3	9.8	8.4	6.9	5.5	5.5
Study investment	0	0.0	0.0	0.0	0.2	0.7	1.5	1.5	1.5	1.4	1.2	1.1	0.9	0.8	0.6	0.5	0.3	0.2	0.0	0.0
Total non-current assets	**0**	**9.1**	**10.8**	**18.6**	**18.8**	**19.3**	**20.1**	**50.7**	**93.3**	**100.9**	**90.3**	**79.7**	**69.1**	**58.5**	**47.9**	**37.3**	**26.7**	**16.1**	**5.5**	**5.5**
Current assets																				
Debtors	0	0	0	0	0	0	0	0	0	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	0
Debtor days	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Stocks	0	0	0	0	0	0	0	0	0	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	0.0
Stock turn	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Cash	30.6	17.6	12.0	0.3	17.7	13.2	8.5	7.3	(46.7)	(34.9)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.2
Total current assets	**30.6**	**17.6**	**12.0**	**0.3**	**17.7**	**13.2**	**8.5**	**7.3**	**(46.7)**	**(12.5)**	**22.3**	**22.3**	**22.3**	**22.3**	**22.3**	**22.3**	**22.3**	**22.3**	**22.3**	**17.2**
Current liabilities																				
Creditors	0	0	0	0	0	0	0	0	0	(5.1)	(5.1)	(5.1)	(5.1)	(5.1)	(5.1)	(5.1)	(5.1)	(5.1)	(5.1)	0
Creditor days	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Short-term debt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total current liabilities	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**(5.1)**	**(5.1)**	**(5.1)**	**(5.1)**	**(5.1)**	**(5.1)**	**(5.1)**	**(5.1)**	**(5.1)**	**(5.1)**	**0**
Net assets	**30.6**	**26.8**	**22.8**	**18.9**	**36.4**	**32.5**	**28.6**	**58.0**	**46.7**	**83.2**	**107.5**	**96.9**	**86.3**	**75.7**	**65.1**	**54.5**	**43.9**	**33.3**	**22.7**	**22.7**
Equity																				
Shareholders' funds	30.6	30.6	30.6	30.6	52.1	52.1	52.1	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2
Retained earnings	0.0	(3.8)	(7.8)	(11.7)	(15.7)	(19.6)	(23.5)	(30.3)	(41.6)	(5.0)	19.2	8.6	(2.0)	(12.6)	(23.2)	(33.8)	(44.4)	(55.0)	(65.6)	(65.6)
Total equity	**30.6**	**26.8**	**22.8**	**18.9**	**36.4**	**32.5**	**28.6**	**58.0**	**46.7**	**83.2**	**107.5**	**96.9**	**86.3**	**75.7**	**65.1**	**54.5**	**43.9**	**33.3**	**22.7**	**22.7**
No of share in issue (m)	30.6	30.6	30.6	30.6	44.0	44.0	44.0	87.2	87.2	87.2	87.2	87.2	87.2	87.2	87.2	87.2	87.2	87.2	87.2	87.2
NAV per share	**1.00**	**0.87**	**0.75**	**0.62**	**0.83**	**0.74**	**0.65**	**0.66**	**0.53**	**0.95**	**1.23**	**1.11**	**0.99**	**0.87**	**0.75**	**0.62**	**0.50**	**0.38**	**0.26**	**0.26**
Net debt	30.6	17.6	12.0	0.3	17.7	13.2	8.5	7.3	(46.7)	(34.9)	0	0	0	0	0	0	0	0	0	17.2
Gearing	(100.0)	(65.9)	(52.6)	(1.6)	(48.5)	(40.7)	(29.6)	(12.6)	100.0	41.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(75.9)
Leverage	N/A	0.0	(110.8)	(1.6)	(94.1)	(68.8)	(42.1)	(14.4)	50.0	29.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(315.0)
CFI																				
Profit after tax	0.0	(3.8)	(3.9)	(3.9)	(4.0)	(3.9)	(3.9)	(6.7)	(11.3)	36.5	36.4	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	0.0
Depreciation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	7.3	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	0.0
Depletion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.0
Amortisation of study investment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Change in debtors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(11.1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1
Change in stocks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(11.3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3
Change in creditors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(5.1)
Operational cash-flow	0.0	(3.8)	(3.9)	(3.9)	(4.0)	(3.9)	(3.9)	(4.0)	(4.0)	28.5	47.0	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	17.2
Investment																				
Capex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(33.3)	(50.0)	(16.7)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exploration	0.0	(9.1)	(1.7)	(7.8)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Study investment	0.0	0.0	0.0	0.0	(0.2)	(0.5)	(0.9)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Investment total	**0.0**	**(9.1)**	**(1.7)**	**(7.8)**	**(0.2)**	**(0.5)**	**(0.9)**	**(33.3)**	**(50.0)**	**(16.7)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Financing																				
Funds raised from equity	30.6	0.0	0.0	0.0	21.5	0.0	0.0	36.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total financing	**30.6**	**0.0**	**0.0**	**0.0**	**21.5**	**0.0**	**0.0**	**36.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total cash-flow	**30.6**	**(13.0)**	**(5.6)**	**(11.7)**	**17.4**	**(4.4)**	**(4.8)**	**(1.2)**	**(54.0)**	**11.8**	**47.0**	**49.8**	**49.8**	**49.8**	**49.8**	**49.8**	**49.8**	**49.8**	**49.8**	**17.2**
Cash at start of period	0.0	30.6	17.6	12.0	0.3	17.7	13.2	8.5	7.3	(46.7)	(34.9)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cash at end of period (before dividend)	30.6	17.6	12.0	0.3	17.7	13.2	8.5	7.3	(46.7)	(34.9)	12.1	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	17.2
Dividend	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.1	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	0.0
Cash at end of period (after dividend)	30.6	17.6	12.0	0.3	17.7	13.2	8.5	7.3	(46.7)	(34.9)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.2
Cash-flow per share	**0.0**	**(0.4)**	**(0.2)**	**(0.4)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.4)**	**(0.6)**	**0.1**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.2**

Source: Edison Investment Research

List of companies used in analysis

Exhibit 97: List of companies used in analysis

African Barrick Gold	Kentor Gold
Agnico-Eagle Mines Ltd	Kermode Resources
Alacer Gold	Kingsgate Consolidated Ltd
Alamos Gold Inc	Kingsrose Mining Ltd
Allied Gold Ltd.	Kinross Gold Corp
Archipelago Resources Plc	Kirkland Lake Gold Inc
Ariana Resources Plc	Klondex Mines
Aurico Gold Inc	Kryso Resources
Aurizon Mines Ltd	La Mancha Resources
Avocet Mining	Lake Shore Gold Corp
Azumah Resources	Lexam Vg Gold
B2Gold Corp	Mariana Resources
Banro Corp	Medusa Mining
Barrick Gold Corp	Metals Exploration
Beadell Resources Ltd	Minera Irl
Brigus Gold	Moneta Porcupine Mines
Bullabulling Gold Ltd	Navigator Resources Ltd
Caledonia Min	Newcrest Mining Ltd
Carpathian Gold Inc	Newmont Mining Corp Of Canada
Carrick Gold Ltd	Norseman Gold Plc
Castle Minerals	Northern Free Gold
Centamin Egypt	Novagold Resources Inc
Centerra Gold Inc	Nyota Minerals Ltd
Central Asia Resources	Oceanagold Corp
Chaarat Gold	Orosur
Citigold Corp Ltd	Orsu
Claude Resources Inc	Orvana Minerals Corp
Cluff Gold	Pan African Resources
Condor Resources	Patagonia Gold
Conroy Diam&Gld	Pc Gold
Coral Gold Resources	Peninsular Gold Ltd
Crocodile Gold Corp	Perseus Mining Ltd
Detour Gold Corp	Petropavlovsk
Dundee Precious Metals Inc	QMX Corp
Dynasty Metals And Mining Inc	Queenston Mining Inc
Eldorado Gold Corp	Randgold Resources
Endeavour Mining	Red 5 Ltd
Entree Gold Inc	Resolute Mining Ltd
Evolution Mining	Richmont Mines Inc
Excalibur Mining Corporation	Saint Andrew Goldfields Ltd
Exeter Resource Corp	Seabridge Gold Inc
Galantas Gold Corporation	Semafo Inc
Gold One International Ltd	Serabi Mining
Goldcorp Inc	Shanta Gold
Golden Queen Mining Company	Silver Lake Resources Ltd
Golden Star Resources Inc	St Barbara Ltd
Goldplat	Stratex International Plc
Goldrush Resources	Sulliden Gold Company Ltd
Great Basin Gold Ltd	Synergy Metals
Greatland Gold	Tanami Gold Nl
Guyana Goldfields Inc	Trans Siberian Gold
Hambledon Mining Plc	Triple Plate Junction
High River Gold Mines Ltd	Troy Resources Nl
Highland Gold	Unity Mining
Hill End Gold Ltd	Vatukoula Gold Mines
Hummingbird Resources Plc	Virginia Mines Inc
Iamgold Corporation	Vista Gold Corp
Inter-Citic Minerals Inc	Wesdome Gold Mines Ltd
International Minerals Corp	Westgold Resources Ltd
Jaguar Mining Inc	Yamana Gold Inc
Jinshan Gold Mines Inc	Yukon-Nevada Gold Corp
Keegan Resources Inc	

Source: Edison Investment Research

Footnotes

[1] Dimson, Elroy, Marsh, Paul and Staunton, Mike, "Global Evidence on the Equity Risk Premium", Journal of Applied Corporate Finance, 2002, http://faculty.london.edu/edimson/assets/documents/Jacf1.pdf

This paper computes the historical ERP for 16 developed countries for the period 1900-2001. Subsequently updated.

[2] Bloomberg definition of beta: "Volatility measure of the price movements of the security versus a representative market index. Derived from the past two years of weekly data, but adjusted for the assumption that a security's beta moves toward the market average over time

The formula is Beta = (0.66666)*Raw Beta + (0.33333)*1.0

Where Raw Beta is defined as the percentage price change of the security given a one percent change in a representative market index."

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