

Gold exploration: Gloom or boom?

MinEx Consulting examines the outlook for gold exploration in 2013 and beyond

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The old saying 'what goes up, must come down' unfortunately seems to apply to the gold exploration business. After a decade of up-and-up, industry sentiment has switched 180 degrees.

However, MinEx Consulting argues that it is not all gloom: the industry is simply starting to face up to the enduring fact that the business cycle is not dead.

In a recent keynote address to the Geological Society of South Africa GeoForum 2013 Conference in Johannesburg MinEx Consulting, gave a detailed talk presentation entitled: 'the long-term outlook for the global exploration industry – gloom or boom?'

At the request of *Mining Journal*, MinEx has recast the assessment to focus on the likely outlook for gold exploration.

The GeoForum presentation included data on the general trends in global expenditures and discovery rates for a range of commodities over the period 1975-2012, and made some predictions on the possible outlook to the year 2020.

The good news is that, over the past decade, global expenditure on mineral exploration, as measured in constant 2012 US dollars, grew by a factor of 10 in real terms from a low of US\$2.9 billion in 2002 to a high of US\$29.4 billion in 2012.

"Higher prices made it worthwhile to revisit old prospects and to explore in new areas"

With regards to gold exploration, total expenditures rose from US\$1.2 billion to US\$10 billion over the same period (see figure 1).

Although the share of total spend directed to gold has dropped from 39% to 34% over this period, gold still remains the main commodity of interest for the exploration industry.

The key driver behind the huge rise in exploration spend has been a corresponding dramatic rise in commodity prices, which have largely been driven by China's seemingly insatiable demand for raw materials.

Higher prices made it worthwhile to revisit old prospects and to explore in new areas. The prices also made it easier to raise funds to invest in exploration and drilling. This, in turn, brought more companies into the sector.

It is estimated that the total number of –



Production drilling at Ridgeway Deeps

mainly junior – companies actively exploring for minerals has more than doubled over the last decade from 1,500 to over 3,500 today. The problem is that the opposite also applies to the number of companies and spend in a period of sustained price decline. Obviously, a number of structural adjustments will need to be made.

Figure 2 shows the strong link over the last two decades between the gold prices and exploration expenditures. The apparent disconnect between gold price and exploration spend pre-1995 was driven by the evolving nature of the industry at the time.

In the 1970s it took time for the industry to respond to the sudden spike in gold prices. In the 1980s and early 1990s, major innovations occurred in exploration search techniques, production methods and financing that made the sector attractive to invest in during a period of declining gold price.

Figure 2 also shows the gold prices forecast by 21 leading economists, investment banks and stock brokers, as compiled by Consensus Economics in June 2013.

Notwithstanding the broad spread of opinions, most experts are predicting a sustained fall in the gold price over the rest of the decade.

Similar trends are apparent with other commodities. Drawing on this, a multi-factor regression model has been developed to predict the likely future level of exploration spend by region and commodity.

The key results for gold are summarised in figure 2, which indicates that, based on the current pessimistic outlook for the gold price,

the forecast amount spent on gold exploration could drop by 25% from US\$10 billion in 2012 to US\$7.6 billion in 2013, before falling further to US\$4.6 billion in constant 2012 dollars by 2020. This is a decline of more than 54%.

To put this into context, the decline in the last two business cycles (1988-1993 and 1997-2002) were 66% and 75%, respectively. The industry should take consolation that the projected US\$4.6 billion expenditure figure for 2020 is still four times bigger than that prevailing at the bottom of the cycle in 1993 and 2002.

Changing direction

Over the past 30 years, there has been a progressive movement of exploration spend away from the traditional mining countries of Canada, US and Australia to emerging players in Latin America, Africa, the former Soviet Union (FSU), Eastern Europe, Mongolia and China.

This move was driven by opportunity. It is particularly worth noting the rising level of exploration expenditures in China, which has moved in-step with the growth in domestic gold production there.

The likely future level of expenditure will vary from region to region. Based on MinEx's regression model, Australia and Pacific/South East Asia are projected to continue to lose market share to Canada, China and the FSU (see figure 3).

This reflects the relative difference in exploration opportunities between the various regions.

It should be emphasised, however, that the actual outcome could be quite different, since it will be influenced not only by changes in the actual gold price, but also by business risk and local exploration success.

With regard to the recent trends in exploration success, MinEx has data on 234 primary gold discoveries (containing more than 0.1Moz each) made over the last decade, amounting to a total resource of 687Moz.

These figures should be treated as being conservative, since they do not include unreported discoveries – on average it takes 3.7 years from initial discovery to reporting a maiden resource – and ignore the fact that deposits invariably grow over time as they get drilled out and during production.

MinEx estimates that adjusting for these factors could increase the above figures by 30-50%, especially for the more recent discoveries.

A June 2012 study by MinEx took into account these factors and estimated that the unit discovery cost for gold in developed countries doubled over the past 20 years and,

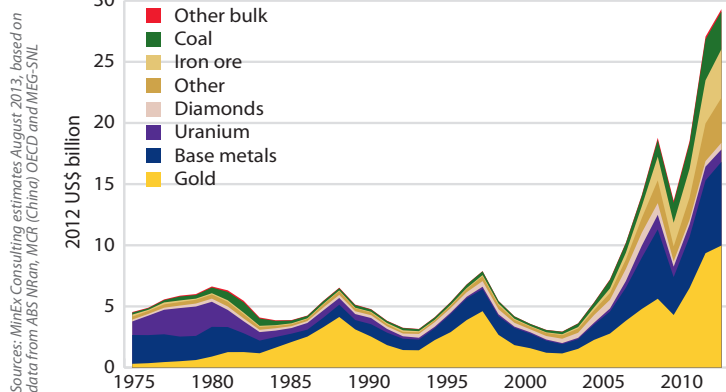


Figure 1: exploration expenditures in the world by commodity

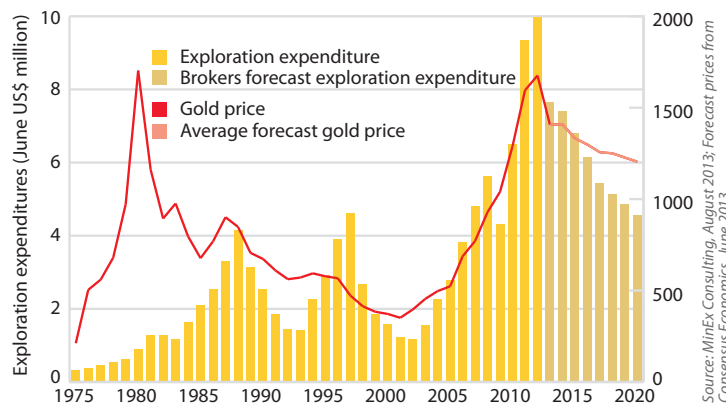


Figure 2: Gold price and world gold exploration expenditures

as was apparent in 2011, is now running at over US\$40/oz (see figure 3).

The discovery performance per unit of spend (or bang-per-buck) varies quite significantly across regions. It also varies depending on which measure is used – whether it be the number, size or quality of deposits found, or the number of ounces discovered.

As outlined in the table (see page 11), over the past decade, Australia accounted for 10% of the spend, and found 12% of the primary gold deposits (by number) but only 4% of the total ounces – suggesting that many of the

“Over the past 30 years, there has been a progressive movement of exploration spend away from the traditional mining countries”

discoveries in Australia were small in size.

The opposite was the case for Canada, which accounted for 20% of the exploration

expenditures, 13% of the deposits (by number) and 32% of the total ounces, most of which were associated with giant discoveries such as Snowfield, Cote Lake and Detour Lake.

More importantly, Canada accounted for 31% of the highly prized tier one and two deposits found in the world during that period.

Africa performed well, and accounted for 18% of the ounces found and 29% of the discoveries by number, for 15% of the spend.

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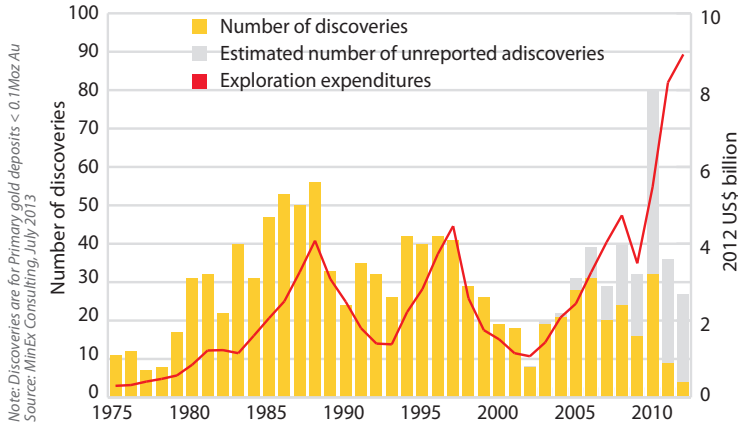


Figure 3: unit discovery costs for gold in developed countries

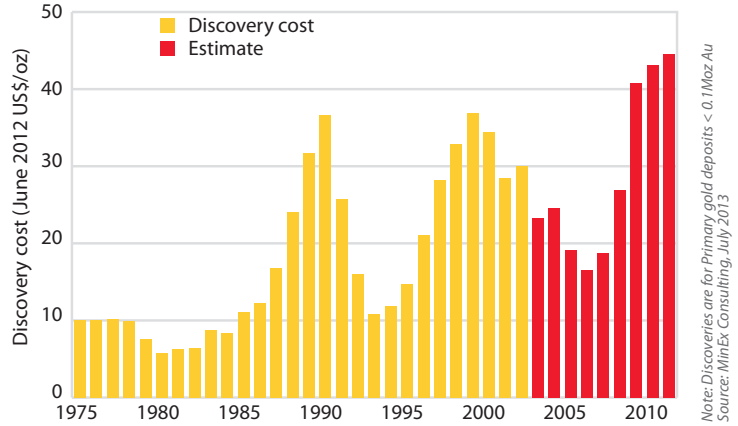


Figure 4: exploration expenditures and gold discoveries in developed countries

By contrast, Pacific/South East Asia and Western Europe (which, for the purposes of this study included Turkey) performed poorly, with no tier one or two primary gold discoveries and only 2% of the total ounces found in the world over that period.

Notwithstanding this, it is worth noting that MinEx's analysis excluded base metal discoveries that contain significant amounts of gold as a by-product. An example of this would be Newcrest Mining Ltd and Harmony Gold Mining Company Ltd's joint discovery of

the world-class Golpu copper-gold deposit in Papua New Guinea.

This deposit has a current resource of 9Mt of copper and over 20Moz of gold. Altogether, MinEx identified 58 base metal and other discoveries over the period 2003-12 that contain a total of 150Moz of by-product gold.

Costs hike

One aspect that is particularly important to the long-term viability of the industry is the disturbing fact that it is becoming progres-

sively more expensive to make discoveries. Figure 4 shows that, in the case of developed countries in the West, over most of the past 40 years the rate of gold discoveries has tended to move in line with the amount of expenditure on gold exploration.

In recent years there has been a dramatic decline in the number of discoveries reported. However, as noted before, it can take several years to drill out and report a discovery. Based on prior studies, MinEx has made a series of estimates to account for these unreported discoveries.

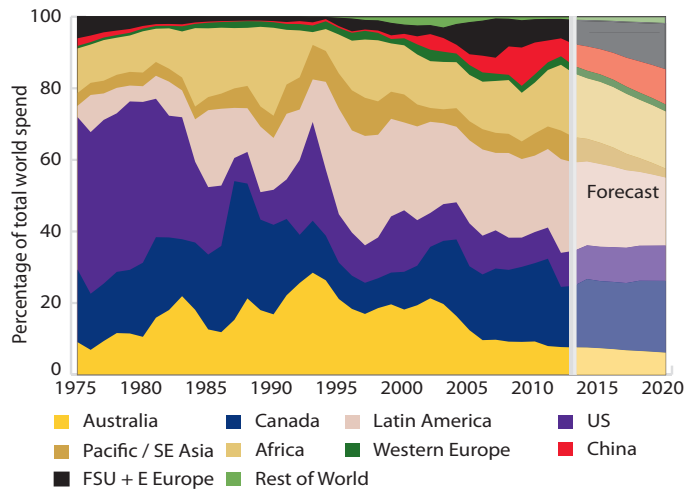
Even after making these adjustments, however, it appears that a large gap has opened up in the last five years between the amount of money spent and the estimated number of discoveries made by industry. It now costs twice as much to make a discovery as before. In other words, exploration productivity has halved.

One oft-cited reason for the decline in performance is the view that the world is running out of easy targets, and that it is progressively becoming more difficult/expensive/riskier to make a discovery.

Many industry commentators lament that "all of the deposits sticking out of the ground have now been found". MinEx takes a more optimistic view. Based on available data for

"In recent years there has been a dramatic decline in the number of discoveries reported"

Figure 5: percentage share of gold exploration expenditures by region



NB: "Rest of World" refers to Mongolia, Middle East and South West Asia (including India and Pakistan) "Western Europe" includes Turkey. Source: MinEx Consulting estimates July 2013, based on data from ABS, NRCAN, MLR (China), OECD and MEG-SNL and commodity price forecasts from Consensus Economics June 2013

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GOLD EXPENDITURES AND DISCOVERY PERFORMANCE FOR 2003-2012

Region	Exploration spend (2012 US\$bn)	Moz discovered	Number of discoveries	Tier 1+2 discoveries				
Australia	4.9	-10%	29	-4%	29	-12%	3	-9%
Canada	10.3	-20%	223	-32%	31	-13%	11	-31%
USA	4.8	-10%	55	-8%	11	-5%	4	-11%
Latin America	11.8	-23%	160	-23%	53	-23%	6	-17%
Pacific / SE Asia	3.1	-6%	5	-1%	5	-2%	-	0%
Africa	7.7	-15%	124	-18%	67	-29%	6	-17%
Western Europe	1.1	-2%	5	-1%	7	-3%	-	0%
China+FSU+EE+RoW	7.2	-14%	86	-13%	31	-13%	5	-14%
Total	51.0	-100%	687	-100%	234	-100%	35	-100%

Source: MinEx Consulting, August 2012 NB: # Discoveries are for Primary gold deposits > 0.1 Moz Au. Excludes satellite deposits within existing camps

201 gold deposits found in the world over the past decade, it estimates that 49% of those were outcropped.

In so-called mature countries such as Canada, the US and Australia, surprisingly 29% of the available discoveries had some form of surface exposure.

Notwithstanding this, the average depth of cover in these mature countries can be considerable and is progressively increasing over time.

More critically, these changes are gradual and do not fully explain the sudden recent decline in exploration productivity.

Input rise

In MinEx's opinion, a more likely culprit is the dramatic and sustained increase in input costs – such as drilling, labour, land access and administration – all of which have doubled in real terms over the past decade.

For example, in Canada, between 2000 and 2012 average drilling costs (as measured in constant 2012 US\$) increased from US\$112/m to US\$210/m, and the cost of hiring an experienced exploration manager increased from US\$93,000/y to US\$170,000/y.

Similar rises have been experienced by other services and in other countries. Consequently, if it costs twice as much to do the same amount of work in the field, it is no real surprise that the cost per discovery also correspondingly doubled.

Ironically, the main factor behind the rise in input costs is the mining boom itself – which drove up the demand for exploration services, as well as strengthening the currencies in many resource-rich countries, which made locally-sourced inputs expensive when measured in US dollar terms.

Exploration outlook

While there may be some comfort, if that is the right word to use, that the end of the boom will result in the industry cycling back to lower exchange rates, as well as cheaper drilling and labour costs, some of the other input costs seem unlikely to fall over time.

Of particular concern is the extra administration burden associated with operating in remote areas and/or addressing safety, social

and environmental concerns. These, in addition to rising government imposts, are likely to get bigger over time.

Offsetting this are continued innovations in search technologies, drilling methods and better business practices.

On balance, MinEx believes that, in the longer term, the industry's discovery performance will improve and, for this reason, we remain optimistic about the future viability of gold exploration.

Unfortunately, this is of little help for those explorers looking at how to survive the next 12 months.

The above highlights the fact that the exploration has been and continues to be a cyclical business and that good opportunities still exist for companies to make valuable gold discoveries.

The challenge, as always, is being efficient and effective in the way companies do their exploration. Some things never change.

Richard Schodde is managing director of MinEx Consulting, a consultancy group that specialises in providing strategic and economic advice to resource companies, with a particular emphasis on the economics of mineral exploration. A copy of the full presentation to the Geological Society of South Africa GeoForum 2013 Conference in Johannesburg can be downloaded at www.minexconsulting.com/publications/jul2013.html

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