

# The yellow book

July 2008



VM Group

Sponsored by Fortis

Tel. +44 20 7487 3600  
[info@vmgroup.co.uk](mailto:info@vmgroup.co.uk)



## Contents

<b>Introduction</b>	<b>4</b>
<b>This time 5 years ago</b>	<b>5</b>
<b>Feature: South African gold industry</b>	<b>6</b>
<b>What happened to European central bank gold sales?</b>	<b>9</b>
<b>The data</b>	<b>13</b>
<b>Weights and measures</b>	<b>33</b>
<b>Glossary</b>	<b>34</b>
<b>Disclaimer and copyright</b>	<b>41</b>
<b>About the VM Group</b>	<b>42</b>

---

**Jessica Cross, CEO**  
The VM Group/MineLife

---

## Introduction

That the Yellow Book is made available to the market on a complimentary basis is due to Fortis Bank SA/NV and the VM Group would like to thank our colleagues at Fortis for their continued support and recognition of the value of this research to the industry.

We remind readers that our data is available electronically in Microsoft Excel format – drop us an email with specific data requests at: [info@virtualmetals.co.uk](mailto:info@virtualmetals.co.uk).

### Housekeeping

- All volumes are in metric tonnes or troy ounces unless stated.
- All references to dollars are US dollars unless stated.
- For space saving in the data tables (production, scrap, and jewellery), countries registering small amounts of gold are grouped into “other”. Please contact us if you need a detailed breakdown.
- Numbers in the tables have been independently rounded and accordingly may not add exactly to indicated totals and subtotals.

## This time 5 years ago

*July 28th 2003*

*Morning fix: \$361.95/oz*

*Afternoon fix: \$365.60/oz*

*Dollar to Sterling: 1.62*

*Dollar to Euro: 1.13*

*Yen to Dollar: 119.46*

*Rand to Dollar: 7.34*

*1 month lease rate: 0.01%*

**Intelligence Wire, March 13<sup>th</sup> 2003:** Bundesbank president Ernst Welteke said it was unclear whether the Central Bank Gold Agreement (CBGA) would be renewed. “Whether there is another gold agreement is open”, he said.

**Reuters, April 23<sup>rd</sup>, 2003:** The Portuguese central bank has reported that it sold 45t from its reserves in March and April. This brings total Portuguese sales to 90t during the four years of the CBGA.

**MarketWatch, May 14<sup>th</sup> 2003:** The World Gold Council has applied to the Securities and Exchange Commission to list a gold-backed exchange traded fund under the symbol, “GLD”. An Australian gold ETF – the world’s first – was launched earlier in the year.

## Feature: South Africa's gold industry

**Analyst: Lindsay Williams**

VM Group

Tel: +44 20 7487 3600

Email: lindsay@vmgroup.co.uk

When the major South African gold miners reported their results for the first three months of 2008, the doomsayers nodded knowingly. Another quarter of reduced production, falling grades, and yet further irrefutable evidence that the industry on which the country was built had taken another step towards going the way of the dodo. Even taking into account the power supply problems that bedevilled the mining industry in January this year, the results were dismal. The difficulties in the country's national electricity supply have merely exacerbated a trend that effectively started as far back as 1970. Today, despite a gold price that so recently scaled record highs, South African gold miners are facing a future as deeply challenging as the ore bodies they exploit. Yet gold is still vital to South Africa. It generated R40bn in total sales in 2007 and employed 168,000 people who received R13bn in wages, and notched up 8% of the country's total exports.

Since the giant Witwatersrand reef was discovered in 1886, South Africa has produced 56,800t of gold, a staggering 32% of all known above ground metal. The country's banking sector and stock exchange rose from the dust of mining. A year after the gold discovery the Johannesburg stock exchange was established, now called JSE Securities Exchange. The year 1887 also saw the birth – purportedly in a coffee shop – of Standard Bank, a chunk of which was recently bought by the Chinese for billions of dollars. As the gold mining industry grew, there was a massive influx of skills and capital into the country. While in those early days the country was reliant on imports, gold profits allowed the development of a local manufacturing industry.

South Africa's gold industry expanded inexorably until by 1970 nearly 80% of the 1,266t produced globally that year came from South Africa. The grade itself was almost as impressive, at more than 13 grams/tonne. In those days the price of gold was essentially fixed at \$35/ounce. So as costs rose it was necessary to mine the higher grades. When US President Richard Nixon liberated the gold price in 1971, the price of the metal embarked on a rally. For South Africa's mines this meant that lower grades were once again viable, and by the early 1980s the grade achieved had almost halved.

### Winds of change in the 1980s

The 1980s determined the industry's future. The apartheid government introduced legislation that forced ring fencing of capital. This sought to stop the mining companies investing profits in new mine projects that would have resulted in a serious erosion of the treasury's tax base because of the tax relief afforded to such project spend. When former President PW Botha's infamous 'Rubicon' speech of 1985 shook the world with its refusal to initiate widely anticipated apartheid reforms, the rand was pressurised and economic sanctions immediately imposed. There was also an effective freeze on new investment in the export mining industry, with gold particularly badly hit as well as political intervention, mining costs were rising at a double digit pace. By the 1990s there were fears that the incoming ANC administration would nationalise the gold industry, which further stifled capital expenditure. The long-term under-investment that was a direct consequence of these perceived political uncertainties had severe implications for South Africa's ageing mines.

One result of political doubt and fiercely rising costs was that gold mines consolidated. The historically ring fenced and separately listed entities with defined leases were replaced by the companies of today's JSE. These new entities regard themselves not simply as South African, but as global gold mining companies, intent on replacing their reserves wherever they can find them.

South Africa's gold mining sector has struggled not just with depleting reserves and political uncertainty but the vagaries of movements in the Rand, the country's currency. The dramatic appreciation of the Rand meant that despite a

strongly rising dollar price for gold, South African mines were seeing relatively less profit thanks to the currency shift. This culminated in 2005, the first year since 1961 (and only the second in history) when the industry made a loss even before capital expenditure considerations were accounted for. This stimulated a further round of consolidation, as well as some drastic pruning of costs involving retrenchments and the closure of loss making shafts. Production plunged, dropping 13% in 2005, 7.5% in 2006, and 7.4% in 2007, by which time the country's mines were producing slightly more than 250t. This represented scarcely more than 10% of global newly mined gold. South Africa, for the first time in modern history, was knocked into second place (in terms of total production) by China.

Does this sorry decline really signify the drawn-out death of the South African gold mining industry? In principle, it should not. After all, there is still a large amount of gold underground in South Africa, with estimates of up to 20,000t which are technically accessible, of which 8,000t-10,000t would be profitable at current prices.

And there has been a very useful run-up in the Rand price of gold, moving from an average price in 2006 of R130,000/kg to a record of more than R250,000/kg in 2008. This has given miners more leeway to invest; capex was R6bn in 2006 and more than R8bn in 2007.

But although the capex of the last two years sounds impressive, it is insufficient to ensure any long-term expansion of the gold industry. All it may do is help slow the pace of decline of production in the next 3-5 years.

South Africa has world-class deposits, but they are extremely deep. In order to exploit them engineers will increasingly have to go as deep as four kilometres below ground, into an environment that has an ambient rock temperature of 55° Celsius, is prone to greater flooding, and at much more risk of seismic activity. The costs involved are enormous, and require investment decisions that will play out over two decades, not two years. This perspective is in deep conflict with the world of quarterly reporting to vociferous shareholders. The risk is that the country's gold mining sector might expire not because there is no longer any gold to dig, but because it will simply cost too much to get it out.

There is also currently far too little certainty that South Africa's gold mines will have the kind of power supply they need for much deeper exploration and mining. Earlier this year the Eskom crisis shut down the gold mines for six days. While the situation in the short term has stabilised, there is now a pervasive atmosphere of caution, mistrust, and suspicion. South African deep level gold mining utilises the bulk of its electricity in a sustaining capacity, for pumping, cooling and ventilation. These activities account for 50%-70% of its power usage. Refrigeration plants below ground are the biggest in the world, the deep level pumps are the world's most sophisticated, and the integrity of the shaft is entirely dependent on them and hence the reliable provision of power. On a positive note, the mines are learning to manage better and implement savings on the other portion of electricity that is used directly for production, and ultimately this will result in greater efficiencies and cost savings. However, despite the intense political spin-doctoring now going on, Eskom has failed to convince mining companies that they are not facing a power supply problem that will sporadically return over the next decade.

The technical and financial problems of trying to extract gold from ever-deeper levels are perhaps the main reasons why South Africa's gold production is destined to decline yet more over the years ahead. On top of these however are other factors that impinge upon all economic growth in the country, not just gold mining. Lack of investment in education for decades has meant the whole country is short of skills. North American and Australian miners, where wages are higher and lifestyles less surrounded by political uncertainty, have been very

active on tempting away highly skilled and experienced senior South African gold mine technocrats. On the macro-economic level, South Africa's consumer price inflation is officially over 10%, with forecasts that it will edge toward 15% in Q3 2008. Strikes are a perennial threat and, with inflation running so high, the climate for labour relations in 2009 is likely to be very tense.

Next year will also see the final implementation of South Africa's mining royalties bill. The details are yet to be rubber-stamped, as each industry will receive individual treatment, but what is certain is that gold companies will be paying a royalty to government that further erodes profitability and effectively amounts to a tax.

### Sparks of hope?

Looking at all these negatives, and facing the reality of a mature industry that will never return to its former halcyon days, it is difficult to detect sparks of hope. As mining techniques become more sophisticated, a high gold price in rand terms might be enough to encourage the South African industry to invest for the very long term, even though the resource itself is difficult to access. And the most challenging hurdle for gold mines to overcome is the critical matter of safety.

2007 was characterised by an increasing intolerance of South African mining's relatively poor safety record. Operations where lives were lost were closed in order to review health and safety procedures. Pressure came from government and the unions, and also from shareholders, who face the choice of investing in the relatively safer and shallower gold mines outside South Africa, or in South African companies where the future has become much less certain.

Risk in South Africa's gold mines can be reduced and is being so, but a fatality-free environment in the context of very deep gold mining is an impossible goal. In order to attempt to reduce the accidents to 'acts of God', rather than human error, the Chamber of Mines now has five permanent experts seconded to it from the industry, to tackle the issue. Safety is now of paramount importance. This was dramatically illustrated when the chief executive of Gold Fields, Nick Holland, during a post results press conference, stated that if the company couldn't mine safely it wouldn't mine at all.

South African gold mining is in decline, and has been for decades. The key challenge is to manage effectively and responsibly limit the pace of the decline. The new breed of industry leaders are faced with an unreliable power source, rising costs, lack of skills, demanding shareholders, and a world that demands a vastly improved working environment for all employees. With hard work and co-operation these are manageable, meaning that gold mining in South Africa will decline slowly and gracefully over the next 40 years. Without a high gold price, trust between government and mines, a cooperative workforce, and a mutual will to govern this process properly, there will be precious little grace in the decline – and it might just become a headlong plunge.

## What happened to European central bank gold sales?

**Analyst: Matthew Turner**

VM Group

Tel: +44 20 7487 3600

Email: matthew@vmgroup.co.uk

During the first Central Bank Gold Agreement (CBGA), which ran from 1999-2004, forecasting the annual level of sales was easy. It was always on or very close to the maximum permitted – 400t a year. Thus, when the CBGA was renewed, and the total annual sales limit was increased to 500t, it seemed obvious that the increase was made because the signatories planned to sell 500t a year. And indeed in the first year, which ran from 2004-2005, sales were exactly on target.

But subsequently they have lagged considerably – with 392.5t sold in 2005-2006 and 475.8t sold in 2006-2007. This year we estimate sales are about 315t with just two months to go, and so could again be well below 400t. Next year, unless the International Monetary Fund gets agreement from its members to sell gold and joins the CBGA, or another country that has so far not announced sales (such as Italy) steps up to the plate, sales will probably be even lower. If this is the case, then total sales over the five-year period might struggle to get over 2,000t, 500t short of the maximum permitted.

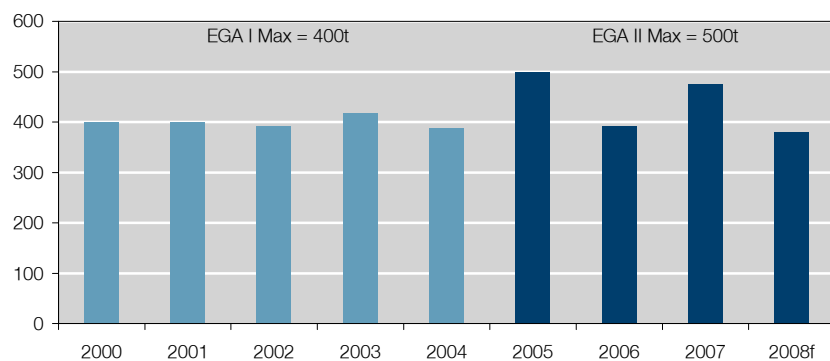
### CBGA year four sales and forecast

Country	Latest (end-July unless stated)	Forecast for full CBGA year
Switzerland	112	137
France	86	120
ECB	72	72
Netherlands	20	29
Sweden	8	10
Unknown	17	-
<b>Total</b>	<b>315</b>	<b>368</b>

Source: VM Group

Note: Swedish sales to July 14th, Unknown (from ECB weekly return) June and July up to 22<sup>nd</sup> July. Swiss sales for July estimated. Forecast based on stated plans and amount needed to complete their sales programmes (for Swiss and Netherlands, but note Netherlands has not sold since November 2007 and so might have already concluded its sales for this year).

### CBGA gold sales by year (tonnes)



Source: VM Group

This shortfall is surprising. When the original agreement was signed in 1999, and then renewed in 2004, a lack of central bank gold up for sale did not seem to be a problem. Indeed, during the first agreement both the Dutch and Swiss could not fit all of their planned sales into the 2000t, and some had to be sold in the second agreement. Furthermore, that the annual sales limit was raised, from 400t to 500t, suggested at the time that the signatories believed 400t would be too low.

The simplest explanation for the shortfall is due to what is essentially a technical issue, namely the lack of German sales. Germany is believed to have negotiated an option to sell up to 120t a year in this agreement, for a total of 600t over five years, similar to France. Clearly if these sales had happened it would have plugged the gap, both in individual years and collectively over the five-year period. But German sales have not materialised, due to a disagreement between the Bundesbank and the Finance Ministry over what to do with the proceeds and, to some extent, the idea of sales at all.

Nevertheless it remains a bullish sign that other countries did not take up the slack after the first year, when 500t was sold. This year the shortfall could be as large as 140t (see table above) if our projections are correct. We are assuming that only the central banks that have sold so far in this CBGA year will sell. It is possible that there could be some sales from central banks that have sold gold in this CBGA (i.e. since 2004) but which have not sold any gold in this CBGA year (from September 2007) – namely Spain, Portugal, Germany, Austria and

Belgium, but it seems unlikely. The two most important are Spain and Portugal, who have made major sales in previous years, but have sold nothing this year. Portugal sold 55t in year 1 and 45t in year 2, but nothing in year 3, and as such we assume its sales plans have ended for now. Spain sold 30t in year 1, 62t in year 2 and 139t last year, but its most recent sale was in July 2007, and there has been no indication of more sales this year. Belgium has also been a hefty seller in the past, but its most recent sale was even longer ago, 12t in August 2005, and seems unlikely to resume sales in the near future. The other two banks on the list, Germany and Austria, have been only small sellers. Germany has sold a small amount (5t in each of the last three years) for coin sales. While Austria had said it would sell up to 90t over the five years of this CBGA, it has actually only sold 37.5t so far, and its rate of selling has been declining each year – in the last CBGA year it sold just 8.7t.

This seeming reluctance to sell strongly implies that there isn't a great deal of gold that the European central banks *plan* to sell. This has major implications for the final year of the CBGA, which starts on 27<sup>th</sup> September 2008. By then, our projections for 2007/2008 mean that Switzerland will have completed its second sales programme, announced in 2007, of 250t. The Netherlands will also have finished its sales programme. Thus, of the known sellers, that leaves only France, Germany, Sweden and the ECB. France will have about 120t to go, which based on past performance we expect they will sell. Sweden is likely to sell 10t-15t, and Germany, unless it has an about-turn on its decision not to make large sales, could again sell small amounts for coins. Collectively these countries will therefore provide 140t or so. The ECB remains a wildcard and could again be a seller, which could mean another 60t-80t as seen in previous years. Again, we are assuming the absence of Spanish, Portuguese, Belgium or Austrian sales. But in total this means sales of just 200t-220t, the lowest level since the 1990s and far short of the 500t limit.

There seem four possibilities here:

- No other sales are forthcoming meaning CBGA sales fall up to 300t short of target and overall supply from the official sector is the lowest for decades. This would be extremely bullish for gold, not just because of the reduced supply but also because of the signal it gives as to the desire to sell gold by central banks not just in that CBGA year but also in any future CBGA (which would surely then seem unnecessary to renew).
- One of the other signatories starts to sell in large volume. The most obvious countries here, simply because of the amount of gold they hold, are Germany and Italy. Between them they have nearly 6,000t t, and very similar shares of gold as a % of foreign reserves, at 65% and 66% respectively. For both there have been suggestions of sales. The German government, and indeed many members of the Bundesbank's Governing board, were keen to sell 500-600t of gold during the five years of CBGA II, but an argument about what should be done with the proceeds of the sales has seen the Bundesbank digging in its heels and effectively preventing any sales. Italy is always difficult to call, but although in August 2007 the Italian parliament passed a motion requiring the government to look into using gold sales as a way of reducing government debt, and the then Prime Minister, Romano Prodi, and his Finance Minister, Tommaso Padoa-Schioppa, both welcomed the motion, absolutely nothing has come of it, with the Bank of Italy thought to be unimpressed. Whilst we do believe Italy and Germany will sell gold at some point, as they are 'overweight' in gold, it doesn't look like being in this CBGA.
- An existing 'known' seller decides to sell more – i.e. France, Switzerland or the Netherlands. This cannot be ruled out, but would go against the spirit of the Agreement to provide clarity about gold sales. As for the Swiss National Bank (SNB), although the words used are not definitive, its President Jean-Pierre Roth said in April that the SNB had 'no plans' to sell more gold than

the 250t announced last year (and which we expect to be completed in this CBGA year).

- The IMF, which wishes to sell 403t, will start to sell in the next CBGA year. The gold sales proposals, part of a broader package of financing reforms, continue to slowly work their way through the international bureaucracy. In early May, 176 of the 185 member country governors agreed the package, although the major stumbling block remains with the US Congress, as the US IMF Executive Director cannot cast his vote without Congressional approval.

We believe IMF gold sales will get Congressional approval and will be part of the CBGA; but the uncertainty is with the timing. Given the Fund's insistence that its sales will not cause any 'market disturbance' it might be assumed they would have to be spread out so as to not mean a huge sale in any one month. As such, to fit into the 2008/2009 CBGA year they will need to begin either late 2008 or early 2009, which will be quite tight. In the absence of IMF sales, it is possible that some of the other central banks are themselves waiting to see what happens. If IMF sales were not to materialise in the 2008/2009 year, these other central banks might enter the market themselves. However this argument stumbles because of the lack of selling seen in the last few months.

In short it is hard not to be bullish, particularly compared with the situation just a few years ago. Then we held the view that central banks were queuing up to sell; after all the point of the CBGA was to make that process orderly. Now there seems to be no real desire to sell, even when there are opportunities to do so. Does this mean central banks have begun to think better of gold as a reserve asset? Central bankers are as likely to be swayed by high prices as individual investors, and with the dollar (the reserve asset currency of choice) declining in value against the euro (the currency of most of these central banks), gold has been the best performing reserve asset in the last few years. Furthermore, the current financial turmoil, and concern over the creditworthiness of other potential reserve assets (such as mortgage-backed bonds) means that, for diversification purposes, gold remains one of the few options. Thus a rational case can be made for postponing gold sales. After all, the memory of the UK and Swiss (first) programmes which occurred when gold was \$300/oz remains fairly bitter for many of those opposed to gold sales. However, we do not believe that there is as yet a long-term reevaluation of the role of gold in a central bank's portfolio; most European central banks remain committed sellers. This is partly because they hold so much gold, far more than portfolio theory would suggest optimal in most cases, and also because the current generation of central bankers in Europe still see gold as an anachronism. If this is correct then gold sales could quickly pick up again, perhaps if the dollar was to strengthen and the gold price slip.

Where does this leave the prospects for a CBGA III, which would begin in late September 2009, if it follows straight on from the CBGA II, as that did from CBGA I? The gold market has become accustomed to these sales pacts, but this should not blind us to the fact that it is a pact that arose out of the need to cope with a structural weakness in the market – a class of investors who believed they were massively overweight in gold and wanted to sell – that threatened to overwhelm it. So to say that such a pact was no longer necessary, given the existence of many more actors on the buy-side (such as private investors), would be a boost to gold's status as a reserve asset, giving holders greater flexibility in how they bought and sold it. On the other hand, such a decision could suffer from bad timing – if the gold market sees a major downturn in the years during which a CBGA III would have existed (2009-2014), then its absence might revive fears of another 'rush for the exit' and exacerbate any bear market.

Ultimately it all might come down to how many central banks express an interest to sell, in particularly the larger holders such as France, Germany and Italy. But even if likely sales are going to be far less than 500t, such an agreed

cap would probably serve a purpose by simply reassuring the market that even very changed circumstances would not see a flood of gold. So currently we see the chance of there being a CBGA III as very high.

## The data

### The methodology

**General comments:** In an industry characterised by large and permanent above-ground stocks, a gold supply/demand balance only attempts to record the additions made to those stocks in a calendar year, the destination of that new supply, the mobilisation of the existing stocks through recycling and official sector sales and lending. Furthermore, it has to be recognised that there are large swathes of the gold market that are clandestine and unofficial, and therefore movements of metal within these sectors are largely beyond measurement and unverifiable. The VM Group (VMG) attempts to avoid spurious accuracy – measuring something to the last two decimal places is a waste of resources considering the global picture for this commodity. In the context of large tonnages of gold being smuggled across borders, the claim that it is possible to measure to fine accuracy the relatively small end-uses such as dental alloys and medallions adds little to the understanding of the big picture.

These supply/demand balances are designed therefore to give overall general flows of metal between regions and sectors.

### The derivation of the data series

- Mine supply – data collated from Raw Materials Group, company reports, the Chamber of Mines of South Africa, ABARE, USBM, China Gold Association and newswires.
- Scrap recycling – data from refineries and industry participants. VMG estimates based on gold price movements, political developments.
- Producer hedging – data from the Mitsui Hedge Report produced by VMG and Haliburton Mineral Services.
- Central Bank transactions – data from IFS statistics, ECB statistics and newswires. Interpretation from discussions with Central Banking sector.
- Jewellery fabrication: data derived from data series published by Consolidated Gold Fields, London until 1988. Individual country data series estimated by VMG from our understanding of the individual markets, discussions with the bullion banks active in various physical markets, jewellery wholesalers, hallmarking figures where available, and trade data, which is subject to interpretation but gives direction of physical flows.
- Jewellery consumption – data series generated by VMG based on our analysis of exports and imports of gold jewellery to and from countries and gross retail sales as reported by a number of countries. The fabrication data was re-allocated on a country-by-country and percentage basis to derive consumption. The calculation of gold jewellery as a percentage of total jewellery retail sales is formula-based and has been verified in the countries concerned. All jewellery figures include old jewellery scrap but exclude process scrap generated during jewellery manufacturing. The generation of process scrap has been assessed depending on the manufacturing process, e.g. machine-made, stamping, casting or hand made. In mature markets, close scrutiny of jewellery fabrication and consumption is not necessary. We know that these have not been growth industries and that jewellery's share of disposable income expenditure has been falling. Thus, in these markets, demographic trends and rising disposable incomes have been offset by life-style preferences that favour other goods over jewellery.

The countries of most interest are those consuming large tonnages of gold jewellery, specifically the USA, India, Turkey, China and countries in the Middle East. For these countries, trade data, retail sales, commodity exchange-related figures or data contributed by industry is sufficient to

generate the needed data series.

- Legal tender coins – data made available by the Mints and refineries concerned, for example, the US Mint, the SA Mint and Rand Refinery. There are some smaller mintings for which VMG does not have data, and therefore this data series probably understates the sector. VMG makes allowance for this in the “other industrial” data series.
- Electronics – data series derived by VMG, based on work relating to the electronics industry when studying the pgm industry and the recycling of electronic scrap.
- Exchange traded funds – data series from published data.
- The “other category” of gold end-uses is an estimate of all other applications of gold including medallions (not legal tender coinage), industrial and decorative uses (excluding electronics), as well as medical and dental demand. With the exception of dental alloys, this combined sector is believed to have shown robust growth over the years and for the purposes of this supply/demand balance, an average growth rate of around 10% between 2000 and 2005 has been applied, although since then the picture has been mixed.

#### **The residual**

The overall supply/demand balance does not balance. The difference between supply and demand (negative is demand exceeding supply), we term the residual. The residual is an acknowledgement that a) omniscience about this market is impossible, and to pretend otherwise is misleading b) there are gold flows of considerable magnitude associated with the unofficial market, such as smuggled or stolen gold which cannot be verified and c) there are sectors which cannot be measured and therefore we do not pretend otherwise; these include “bar hoarding”, which is the purchase of gold in bar form, the vast majority of which is rapidly turned into jewellery.

The residual also does not reflect the net long or short positions held by the hedge funds or the speculators over year-end. While CFTC data gives an indication of outstanding positions on COMEX, it is not possible to put a number on the net longs or shorts in the OTC market.

## Physical supply and demand, world total and by region, 2003-2008fe

## World total and regional supply/demand imbalances (tonnes)

	World total						North America					
	2003	2004	2005	2006	2007	2008f	2003	2004	2005	2006	2007	2008f
<b>Supply</b>												
Mine supply	2,512	2,351	2,411	2,379	2,426	2,449	421	389	380	364	349	360
Scrap recycling	900	1,100	836	1,057	981	1,079	75	81	70	88	83	92
Hedging	188	68	84	45	71	3	41	19	30	29	48	1
Central Bank sales	571	464	616	379	603	333	15	0	0	2	0	0
<b>Total supply</b>	<b>4,171</b>	<b>3,983</b>	<b>3,947</b>	<b>3,859</b>	<b>4,081</b>	<b>3,864</b>	<b>552</b>	<b>489</b>	<b>480</b>	<b>482</b>	<b>480</b>	<b>453</b>
<b>Demand</b>												
Jewellery fabrication	2,808	2,878	2,996	2,276	2,227	2,152	212	212	207	177	164	149
Jewellery consumption	2,808	2,878	2,996	2,276	2,227	2,152	405	396	390	351	334	306
Legal tender coins	85	91	101	97	92	123	23	26	24	25	31	41
Electronics	310	332	357	372	403	416	71	73	75	78	84	87
Other end uses	315	350	393	315	311	313	31	31	31	29	29	28
ETFs	33	125	195	253	260	197	0	95	178	212	185	100
Central Bank purchases	39	61	39	132	68	57	0	0	0	0	0	0
Dehedging	529	524	223	455	493	339	298	195	146	336	245	119
<b>Total Demand</b>	<b>4,118</b>	<b>4,362</b>	<b>4,304</b>	<b>3,901</b>	<b>3,853</b>	<b>3,596</b>	<b>827</b>	<b>816</b>	<b>844</b>	<b>1,032</b>	<b>908</b>	<b>681</b>
<b>Residual (supply less demand)</b>	<b>52</b>	<b>(378)</b>	<b>(357)</b>	<b>(41)</b>	<b>228</b>	<b>268</b>	<b>(276)</b>	<b>(327)</b>	<b>(365)</b>	<b>(549)</b>	<b>(428)</b>	<b>(228)</b>
	Europe						Asia					
	2003	2004	2005	2006	2007	2008f	2003	2004	2005	2006	2007	2008f
<b>Supply</b>												
Mine supply	22	18	15	19	13	14	408	365	413	403	484	493
Scrap recycling	135	163	102	126	117	129	222	261	237	288	269	296
Hedging	50	0	9	15	7	0	0	0	0	0	0	0
Central Bank sales	454	410	529	338	534	311	20	34	67	11	12	13
<b>Total supply</b>	<b>660</b>	<b>590</b>	<b>654</b>	<b>498</b>	<b>672</b>	<b>454</b>	<b>650</b>	<b>660</b>	<b>717</b>	<b>702</b>	<b>755</b>	<b>802</b>
<b>Demand</b>												
Jewellery fabrication	777	790	791	671	688	651	683	696	716	584	566	581
Jewellery consumption	540	547	546	476	473	444	602	614	633	499	485	505
Legal tender coins	57	57	68	63	53	71	0	0	0	0	0	0
Electronics	40	41	43	44	48	49	181	200	221	230	249	258
Other end uses	116	128	143	114	112	113	66	70	74	64	64	63
ETFs	25	28	9	36	51	90	0	0	0	0	0	0
Central Bank purchases	0	0	0	0	1	0	7	3	4	7	2	5
Dehedging	0	22	9	5	32	10	0	0	0	0	0	0
<b>Total Demand</b>	<b>777</b>	<b>823</b>	<b>818</b>	<b>739</b>	<b>770</b>	<b>777</b>	<b>857</b>	<b>887</b>	<b>931</b>	<b>800</b>	<b>800</b>	<b>830</b>
<b>Residual (supply less demand)</b>	<b>(117)</b>	<b>(233)</b>	<b>(164)</b>	<b>(241)</b>	<b>(97)</b>	<b>(323)</b>	<b>(207)</b>	<b>(228)</b>	<b>(214)</b>	<b>(98)</b>	<b>(35)</b>	<b>(28)</b>
	Indian sub-continent						Middle East					
	2003	2004	2005	2006	2007	2008f	2003	2004	2005	2006	2007	2008f
<b>Supply</b>												
Mine supply	3	5	3	3	3	3	10	9	8	8	8	8
Scrap recycling	149	186	142	198	180	198	195	270	188	235	214	235
Hedging	0	0	0	0	0	0	0	0	0	0	0	0
Central Bank sales	0	0	0	0	0	0	20	20	20	20	0	0
<b>Total supply</b>	<b>152</b>	<b>191</b>	<b>145</b>	<b>200</b>	<b>182</b>	<b>200</b>	<b>225</b>	<b>299</b>	<b>216</b>	<b>263</b>	<b>222</b>	<b>243</b>
<b>Demand</b>												
Jewellery fabrication	575	607	661	397	357	322	416	426	466	321	336	341
Jewellery consumption	627	661	714	437	401	366	503	528	572	399	429	435
Legal tender coins	0	0	0	0	0	0	0	0	0	0	0	0
Electronics	0	0	0	0	0	0	0	0	0	0	0	0
Other end uses	70	86	105	79	78	80	21	24	28	19	17	19
ETFs	0	0	0	0	4	2	0	0	0	0	0	0
Central Bank purchases	0	0	0	0	0	0	0	0	30	100	12	14
Dehedging	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Demand</b>	<b>698</b>	<b>747</b>	<b>819</b>	<b>516</b>	<b>483</b>	<b>448</b>	<b>524</b>	<b>552</b>	<b>631</b>	<b>518</b>	<b>459</b>	<b>468</b>
<b>Residual (supply less demand)</b>	<b>(545)</b>	<b>(556)</b>	<b>(674)</b>	<b>(316)</b>	<b>(301)</b>	<b>(247)</b>	<b>(299)</b>	<b>(254)</b>	<b>(415)</b>	<b>(255)</b>	<b>(237)</b>	<b>(225)</b>

Source: VM Group

Note: Regional totals include jewellery consumption but not jewellery fabrication. Totals might not add due to rounding.

## World total and regional supply/demand imbalances (tonnes)

	Latin America						Africa					
	2003	2004	2005	2006	2007	2008f	2003	2004	2005	2006	2007	2008f
<b>Supply</b>												
Mine supply	391	374	433	466	441	453	598	551	512	513	508	494
Scrap recycling	61	69	40	50	48	52	20	22	15	18	16	18
Hedging	0	0	0	0	0	0	0	16	12	0	4	0
Central Bank sales	0	0	0	6	0	3	58	0	0	0	0	3
<b>Total supply</b>	<b>452</b>	<b>443</b>	<b>473</b>	<b>522</b>	<b>489</b>	<b>508</b>	<b>676</b>	<b>589</b>	<b>538</b>	<b>531</b>	<b>529</b>	<b>514</b>
<b>Demand</b>				<b>0</b>	<b>0</b>	<b>0</b>						
Jewellery fabrication	77	78	80	68	63	57	29	31	31	21	20	20
Jewellery consumption	65	65	66	56	52	47	28	28	29	19	18	19
Legal tender coins	0	0	0	0	0	0	2	3	3	3	3	4
Electronics	1	2	2	2	2	2	0	0	0	0	0	0
Other end uses	9	10	11	10	11	10	0	0	0	0	0	0
ETFs	0	0	0	0	0	0	0	3	4	3	14	5
Central Bank purchases	28	55	0	0	1	0	0	0	0	0	0	0
Dehedging	0	0	0	0	0	0	99	170	0	40	30	151
<b>Total Demand</b>	<b>104</b>	<b>131</b>	<b>79</b>	<b>68</b>	<b>65</b>	<b>59</b>	<b>129</b>	<b>204</b>	<b>36</b>	<b>65</b>	<b>65</b>	<b>178</b>
<b>Residual (supply less demand)</b>	<b>348</b>	<b>312</b>	<b>395</b>	<b>455</b>	<b>424</b>	<b>449</b>	<b>547</b>	<b>384</b>	<b>502</b>	<b>467</b>	<b>464</b>	<b>337</b>
	Australasia						Eastern Europe					
	2003	2004	2005	2006	2007	2008f	2003	2004	2005	2006	2007	2008f
<b>Supply</b>												
Mine supply	364	339	347	317	325	327	296	302	301	285	295	298
Scrap recycling	3	4	3	4	3	4	40	45	40	53	50	55
Hedging	97	33	33	1	16	2	0	0	0	0	0	0
Central Bank sales	0	0	0	0	0	0	5	0	0	1	56	3
<b>Total supply</b>	<b>463</b>	<b>376</b>	<b>382</b>	<b>321</b>	<b>340</b>	<b>333</b>	<b>342</b>	<b>347</b>	<b>341</b>	<b>339</b>	<b>402</b>	<b>356</b>
<b>Demand</b>												
Jewellery fabrication	5	5	6	5	4	4	34	34	39	33	30	28
Jewellery consumption	5	5	6	5	4	4	34	34	39	33	30	28
Legal tender coins	3	5	6	6	5	7	0	0	0	0	0	0
Electronics	1	1	1	1	1	1	16	16	17	17	19	19
Other end uses	0	0	0	0	0	0	0	0	0	0	0	0
ETFs	8	(1)	1	2	6	0	0	0	0	0	0	0
Central Bank purchases	0	0	0	0	0	0	4	3	5	25	52	38
Dehedging	132	137	68	74	186	59	0	0	0	0	0	0
<b>Total Demand</b>	<b>150</b>	<b>147</b>	<b>81</b>	<b>88</b>	<b>202</b>	<b>72</b>	<b>53</b>	<b>54</b>	<b>61</b>	<b>76</b>	<b>101</b>	<b>85</b>
<b>Residual (supply less demand)</b>	<b>314</b>	<b>229</b>	<b>301</b>	<b>234</b>	<b>138</b>	<b>261</b>	<b>288</b>	<b>293</b>	<b>280</b>	<b>263</b>	<b>301</b>	<b>272</b>

Source: VM Group

Note: Regional totals include jewellery consumption but not jewellery fabrication. Totals might not add due to rounding. The allocation of hedging and dehedging to individual regions is complicated and for simplicity we have used the regions used in The Fortis Hedging and Financial Gold Report.

## Primary mine supply, 2003-2008f (tonnes)

	2003	2004	2005	2006	2007e	2008f
South Africa	375.8	343.0	294.8	272.0	260.0	237.0
Ghana	70.0	60.0	66.5	72.0	80.0	80.0
Mali	48.0	40.0	44.2	62.0	64.0	68.0
Tanzania	45.0	48.0	45.5	45.0	47.0	50.0
Guinea	16.5	13.0	13.0	17.0	18.0	18.5
Other Africa	11.9	10.9	15.7	18.6	14.0	15.0
Congo (Dem Rep)	5.0	5.0	5.0	5.0	5.0	6.0
Ethiopia	6.0	6.0	6.0	6.0	6.0	6.0
Sudan	5.1	5.0	5.0	3.5	5.0	5.0
Zimbabwe	12.6	20.0	14.0	11.0	7.0	5.0
Cote D'Ivoire	2.0	0.0	2.0	1.4	2.0	3.0
<b>Total Africa</b>	<b>597.9</b>	<b>550.9</b>	<b>511.7</b>	<b>513.4</b>	<b>508.0</b>	<b>493.5</b>
China	213.0	220.0	224.0	240.0	270.5	295.0
Indonesia	147.0	100.0	142.0	110.9	147.9	125.0
Other Asia	16.7	10.7	10.7	9.2	22.0	30.0
Mongolia	12.0	16.0	18.0	24.0	24.0	24.0
Japan	8.2	8.0	7.5	7.5	7.3	7.0
Philippines	5.8	5.0	6.2	6.8	7.0	7.0
North Korea	5.0	5.0	5.0	5.0	5.0	5.0
<b>Total Asia</b>	<b>407.7</b>	<b>364.7</b>	<b>413.4</b>	<b>403.3</b>	<b>483.7</b>	<b>493.0</b>
Australia	284.0	253.0	264.0	247.0	253.0	250.0
Papua New Guinea	66.0	71.0	68.7	58.3	60.0	65.0
New Zealand	10.0	11.0	11.0	10.0	10.0	10.0
Fiji	3.6	4.0	2.8	1.7	2.0	2.0
Other Australasia	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Australasia</b>	<b>363.6</b>	<b>339.0</b>	<b>346.5</b>	<b>317.0</b>	<b>325.0</b>	<b>327.0</b>
Russia	158.0	159.0	168.0	165.0	162.8	160.0
Uzbekistan	86.0	90.0	86.0	85.0	88.0	88.0
Kazakhstan	20.0	22.0	22.0	20.0	21.4	21.0
Kyrgyzstan	22.5	22.0	17.0	11.0	15.0	19.0
Other Eastern Europe	10.0	9.0	7.7	4.2	8.0	10.0
<b>Total Eastern Europe</b>	<b>296.5</b>	<b>302.0</b>	<b>300.7</b>	<b>285.2</b>	<b>295.2</b>	<b>298.0</b>
Sweden	5.7	6.0	5.2	6.8	6.8	6.8
Spain	7.0	5.0	3.0	3.0	3.0	3.0
Other Western Europe	8.9	6.5	6.3	9.3	3.3	4.0
<b>Total Western Europe</b>	<b>21.6</b>	<b>17.5</b>	<b>14.5</b>	<b>19.1</b>	<b>13.1</b>	<b>13.8</b>
India	3.3	5.0	3.4	2.5	2.7	2.8
<b>Total Indian sub-continent</b>	<b>3.3</b>	<b>5.0</b>	<b>3.4</b>	<b>2.5</b>	<b>2.7</b>	<b>2.8</b>
Peru	172.6	173.0	207.8	203.6	170.1	180.0
Argentina	28.6	27.0	25.0	44.0	44.0	44.0
Brazil	34.0	34.0	35.0	41.0	42.0	42.0
Chile	38.9	39.0	39.6	40.8	40.9	41.0
Colombia	46.5	30.0	35.8	37.0	39.0	39.0
Mexico	22.2	24.0	31.6	33.7	35.0	35.0
Other Latin America	1.6	11.0	15.7	22.2	26.0	28.0
Venezuela	15.0	15.0	14.0	16.0	16.0	15.0
Bolivia	7.0	0.0	8.9	9.6	10.0	10.0
Guyana	12.0	12.0	8.2	6.4	6.2	5.5
Ecuador	4.0	0.0	4.0	4.0	4.0	5.0
Honduras	5.0	4.0	4.5	4.5	4.5	4.5
Nicaragua	3.5	5.0	3.4	3.5	3.6	3.7
Dominican Republic	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Latin America</b>	<b>390.9</b>	<b>374.0</b>	<b>433.4</b>	<b>466.3</b>	<b>441.3</b>	<b>452.7</b>
Saudi Arabia	8.8	8.0	8.0	8.0	8.0	8.0
Other Middle East	0.8	1.0	0.0	0.0	0.0	0.0
<b>Total Middle East</b>	<b>9.6</b>	<b>9.0</b>	<b>8.0</b>	<b>8.0</b>	<b>8.0</b>	<b>8.0</b>
USA	280.0	260.0	261.0	260.0	248.0	250.0
Canada	140.6	129.0	118.5	104.0	101.2	110.0
<b>Total North America</b>	<b>420.6</b>	<b>389.0</b>	<b>379.5</b>	<b>364.0</b>	<b>349.2</b>	<b>360.0</b>
<b>World total</b>	<b>2511.6</b>	<b>2351.1</b>	<b>2411.2</b>	<b>2378.7</b>	<b>2426.2</b>	<b>2448.8</b>

Source: Raw Materials Group, Chamber of Mines, South Africa, News Wires

## Scrap recycling (excluding process scrap), 2003-2008f (tonnes)

	2003	2004	2005	2006	2007e	2008f
Algeria	5.2	5.4	4.0	4.9	4.4	4.9
Morocco	5.1	5.5	4.0	4.9	4.4	4.8
Tunisia	5.1	5.2	3.5	4.3	3.9	4.3
Other Africa	5.0	5.5	3.0	3.7	3.5	3.8
<b>Total Africa</b>	<b>20.4</b>	<b>21.6</b>	<b>14.5</b>	<b>17.7</b>	<b>16.2</b>	<b>17.8</b>
Thailand	35.0	45.0	45.0	54.9	52.3	57.5
Indonesia	30.0	33.0	40.0	48.8	44.4	48.8
Japan	35.0	42.0	30.0	35.1	33.4	36.8
Malaysia	18.0	18.0	30.0	36.6	33.3	36.6
China	35.0	37.0	25.0	30.5	29.0	32.0
Philippines	12.0	15.0	18.0	22.0	20.0	22.0
South Korea	18.0	20.0	15.0	18.3	17.4	19.2
Taiwan	12.0	16.0	12.0	14.6	13.9	15.3
Singapore	12.0	15.0	10.0	12.2	11.6	12.8
Hong Kong	12.0	17.0	10.0	12.2	11.6	12.8
Myanmar	3.0	3.0	2.0	2.4	2.3	2.6
<b>Total Asia</b>	<b>222.0</b>	<b>261.0</b>	<b>237.0</b>	<b>287.6</b>	<b>269.3</b>	<b>296.2</b>
Australia	3.0	4.0	3.0	3.5	3.3	3.7
<b>Total Australasia</b>	<b>3.0</b>	<b>4.0</b>	<b>3.0</b>	<b>3.5</b>	<b>3.3</b>	<b>3.7</b>
Russia	40.0	45.0	40.0	52.8	50.3	55.3
<b>Total Eastern Europe</b>	<b>40.0</b>	<b>45.0</b>	<b>40.0</b>	<b>52.8</b>	<b>50.3</b>	<b>55.3</b>
Turkey	65.0	80.0	40.0	48.8	44.4	48.8
Italy	30.0	34.0	26.0	32.5	31.0	34.0
France	5.2	7.0	6.0	7.5	7.1	7.9
Germany	6.0	7.0	5.0	6.3	6.0	6.5
Switzerland	6.0	6.8	5.0	6.3	6.0	6.5
UK & Ireland	6.0	7.0	5.0	6.3	6.0	6.5
Other	16.4	21.1	14.5	18.0	17.1	18.8
<b>Total Western Europe</b>	<b>134.6</b>	<b>162.9</b>	<b>101.5</b>	<b>125.5</b>	<b>117.4</b>	<b>129.2</b>
Sri Lanka	120.0	145.0	115.0	161.0	146.4	161.0
Pakistan	22.0	30.0	20.0	28.0	25.5	28.0
India	4.0	7.0	4.0	4.9	4.4	4.9
Bangladesh	3.0	4.0	3.0	3.7	3.3	3.7
<b>Total Indian subcontinent</b>	<b>149.0</b>	<b>186.0</b>	<b>142.0</b>	<b>197.5</b>	<b>179.6</b>	<b>197.5</b>
Argentina	7.0	8.0	6.0	7.5	7.1	7.9
Brazil	7.0	10.0	6.0	7.5	7.1	7.9
Chile	7.0	8.0	5.0	6.3	6.0	6.5
Colombia	8.0	8.0	5.0	6.3	6.0	6.5
Mexico	8.0	8.0	5.0	6.3	6.0	6.5
Other Latin America	8.0	10.0	5.0	6.3	6.0	6.5
Peru	8.0	8.0	4.0	5.0	4.8	5.2
Venezuela	8.0	9.0	4.0	5.0	4.8	5.2
<b>Total Latin America</b>	<b>61.0</b>	<b>69.0</b>	<b>40.0</b>	<b>50.0</b>	<b>47.6</b>	<b>52.4</b>
Saudi Arabia	70.0	90.0	70.0	87.5	79.5	87.5
Iraq	40.0	65.0	40.0	50.0	45.5	50.0
Egypt	30.0	33.0	20.0	25.0	22.7	25.0
Iran	15.0	28.0	20.0	25.0	22.7	25.0
Kuwait	20.0	25.0	20.0	25.0	22.7	25.0
UAE	10.0	15.0	10.0	12.5	11.4	12.5
Lebanon	6.0	9.0	5.0	6.3	5.7	6.3
Israel	4.0	4.5	3.0	3.8	3.4	3.8
<b>Total Middle East</b>	<b>195.0</b>	<b>269.5</b>	<b>188.0</b>	<b>235.0</b>	<b>213.6</b>	<b>235.0</b>
USA	70.0	75.0	65.0	81.3	77.4	85.1
Canada	5.0	6.0	5.0	6.3	6.0	6.5
<b>Total North America</b>	<b>75.0</b>	<b>81.0</b>	<b>70.0</b>	<b>87.5</b>	<b>83.3</b>	<b>91.7</b>
<b>World total</b>	<b>900.0</b>	<b>1,100.0</b>	<b>836.0</b>	<b>1,057.2</b>	<b>980.7</b>	<b>1,078.8</b>

Source: VM Group

---

**Jewellery fabrication, 2003-2008f (tonnes)**


---

	2003	2004	2005	2006	2007e	2008f
South Africa	8.0	9.6	9.6	8.2	7.4	7.5
Morocco	10.0	10.0	10.0	6.0	5.7	5.8
Libya	5.0	5.0	5.0	3.0	3.0	3.0
Algeria	5.0	5.0	5.0	3.0	2.9	2.9
Tunisia	1.0	1.0	1.0	0.6	0.7	0.7
<b>Total Africa</b>	<b>29.0</b>	<b>30.6</b>	<b>30.6</b>	<b>20.8</b>	<b>19.6</b>	<b>19.9</b>
China	230.0	240.0	250.0	260.0	252.2	244.6
Indonesia	100.0	100.0	100.0	60.0	57.0	58.1
Thailand	75.0	75.0	70.0	56.0	53.2	47.9
Taiwan	75.0	70.0	70.0	56.0	53.2	47.9
South Korea	50.0	50.0	52.0	31.2	31.5	30.6
Malaysia	50.0	50.0	55.0	33.0	31.4	28.2
Japan	25.0	25.0	25.0	22.5	21.4	19.2
Vietnam	25.0	30.0	34.5	20.7	25.0	65.0
Hong Kong	15.0	17.3	20.0	17.0	15.2	14.7
Afghanistan	10.0	10.0	10.0	8.0	7.9	8.1
Singapore	10.0	10.0	10.0	8.0	7.6	6.8
Cambodia	10.0	10.0	10.0	6.0	5.7	5.2
Other Asia	8.0	9.0	9.0	5.4	5.1	4.9
<b>Total Asia</b>	<b>683.0</b>	<b>696.3</b>	<b>715.5</b>	<b>583.8</b>	<b>566.3</b>	<b>581.3</b>
Australia	5.0	5.0	5.5	4.7	4.3	4.1
<b>Total Australasia</b>	<b>5.0</b>	<b>5.0</b>	<b>5.5</b>	<b>4.7</b>	<b>4.3</b>	<b>4.1</b>
Russia	30.0	30.0	35.0	29.8	26.8	24.3
Uzbekistan	3.0	3.0	3.0	2.6	2.3	2.2
Croatia	0.6	0.7	0.7	0.6	0.5	0.5
Bulgaria	0.3	0.3	0.3	0.3	0.3	0.2
Estonia	0.1	0.2	0.2	0.2	0.2	0.1
<b>Total Eastern Europe</b>	<b>34.0</b>	<b>34.2</b>	<b>39.2</b>	<b>33.4</b>	30.1	27.5
Italy	350.0	330.0	320.0	304.0	288.8	262.5
Turkey	225.7	263.6	283.5	192.7	230.8	235.4
UK & Ireland	50.0	49.0	38.0	32.0	32.8	29.8
Switzerland	30.0	30.0	30.0	28.5	27.1	24.6
Spain	30.0	30.0	30.0	28.5	27.1	24.6
Germany	25.0	22.5	22.5	21.4	20.3	18.5
France	22.0	20.0	22.0	20.9	19.9	18.1
Portugal	10.0	10.0	10.0	9.5	9.0	8.2
Greece	9.0	10.0	10.0	9.5	9.0	8.2
Poland	5.2	5.5	5.5	5.2	5.0	4.5
Other Western Europe	19.9	19.1	19.6	18.6	17.8	16.3
<b>Total Western Europe</b>	<b>776.8</b>	<b>789.7</b>	<b>791.1</b>	<b>670.8</b>	<b>687.5</b>	<b>650.7</b>
India	500.0	532.0	592.5	355.5	319.9	287.9
Pakistan	50.0	50.0	50.0	30.0	27.0	24.3
Bangladesh	20.0	20.0	14.0	8.4	7.6	6.8
Sri Lanka	5.0	5.0	5.0	3.0	2.7	2.6
<b>Total Indian sub-continent</b>	<b>575.0</b>	<b>607.0</b>	<b>661.5</b>	<b>396.9</b>	<b>357.2</b>	<b>321.6</b>
Mexico	30.0	30.0	30.0	25.5	23.6	21.4
Brazil	20.0	20.0	22.0	18.7	17.3	15.7
Dominican Republic	6.0	6.0	6.0	5.1	4.7	4.3
Peru	5.0	5.0	5.0	4.3	3.9	3.6
Chile	5.0	5.0	5.0	4.3	3.9	3.6
Colombia	3.0	3.0	3.0	2.6	2.4	2.1
Bolivia	2.9	3.0	3.0	2.6	2.4	2.1
Venezuela	2.0	2.0	2.0	1.7	1.6	1.4
Ecuador	2.0	2.0	2.0	1.7	1.6	1.4
Argentina	1.5	1.5	1.5	1.3	1.2	1.1
<b>Total Latin America</b>	<b>77.4</b>	<b>77.5</b>	<b>79.5</b>	<b>67.6</b>	<b>62.5</b>	<b>56.8</b>

Continued overleaf

**Jewellery fabrication, 2003-2008f (tonnes)**

	2003	2004	2005	2006	2007	2008f
Saudi Arabia	170.0	180.0	190.0	133.0	139.7	142.4
Egypt	75.0	75.0	85.0	55.3	58.0	59.2
UAE	47.5	50.0	55.0	38.5	40.4	41.2
Iran	35.0	35.0	40.0	34.0	35.7	36.4
Iraq	35.0	30.0	35.0	21.0	22.1	22.5
Kuwait	15.0	15.0	17.5	10.9	11.4	11.6
Israel	14.0	15.0	15.0	12.3	11.7	10.6
Lebanon	9.0	10.0	12.0	6.6	6.9	7.1
Other Middle East	15.6	16.0	16.3	9.3	9.8	10.0
<b>Total Middle East</b>	<b>416.1</b>	<b>426.0</b>	<b>465.8</b>	<b>320.8</b>	<b>335.7</b>	<b>341.1</b>
USA	200.0	200.0	195.0	165.8	153.3	139.4
Canada	12.0	12.0	12.0	11.4	10.5	9.6
<b>Total North America</b>	<b>212.0</b>	<b>212.0</b>	<b>207.0</b>	<b>177.2</b>	<b>163.9</b>	<b>149.0</b>
<b>World total</b>	<b>2,808.3</b>	<b>2,878.2</b>	<b>2,995.6</b>	<b>2,275.8</b>	<b>2,227.0</b>	<b>2,152.0</b>

Source: VM Group

**Jewellery consumption, 2003-2008f (tonnes)**

	2003	2004	2005	2006	2007	2008f
Morocco	8.8	8.8	8.9	5.4	5.2	5.3
South Africa	5.2	5.9	5.9	5.1	4.7	4.6
Other Africa	13.9	13.7	14.1	8.5	8.5	8.6
<b>Total Africa</b>	<b>27.9</b>	<b>28.4</b>	<b>28.9</b>	<b>19.0</b>	<b>18.4</b>	<b>18.6</b>
China	258.2	265.0	274.2	252.6	243.2	233.1
Indonesia	81.3	82.0	82.8	57.7	55.2	55.1
South Korea	37.5	37.5	39.0	23.4	23.6	22.9
Japan	29.4	28.8	28.8	24.2	23.0	21.0
Afghanistan	26.1	27.0	28.5	19.9	20.0	19.9
Thailand	29.9	29.9	28.3	21.6	20.5	18.8
Taiwan	29.3	27.5	27.3	21.8	20.7	18.7
Vietnam	25.0	30.0	34.5	20.7	25.0	65.0
Malaysia	27.7	27.6	29.1	18.4	17.5	16.1
Singapore	18.9	18.9	19.4	12.9	12.2	11.3
Philippines	11.7	11.7	11.8	7.5	7.1	6.9
Myanmar	11.7	12.7	12.6	8.0	7.5	6.8
Other Asia	15.8	16.1	16.5	10.7	9.9	9.2
<b>Total Asia</b>	<b>602.2</b>	<b>614.4</b>	<b>632.9</b>	<b>499.3</b>	<b>485.4</b>	<b>504.8</b>
Australia	5.0	5.0	5.5	4.7	4.3	4.1
<b>Total Australasia</b>	<b>5.0</b>	<b>5.0</b>	<b>5.5</b>	<b>4.7</b>	<b>4.3</b>	<b>4.1</b>
Russia	30.0	30.0	35.0	29.8	26.8	24.3
Uzbekistan	3.0	3.0	3.0	2.6	2.3	2.2
Croatia	0.6	0.7	0.7	0.6	0.5	0.5
Bulgaria	0.3	0.3	0.3	0.3	0.3	0.2
Estonia	0.1	0.2	0.2	0.2	0.2	0.1
<b>Total Eastern Europe</b>	<b>34.0</b>	<b>34.2</b>	<b>39.2</b>	<b>33.4</b>	<b>30.1</b>	<b>27.5</b>
Turkey	112.1	128.5	137.6	98.9	114.7	116.0
Italy	92.5	87.4	85.1	81.1	77.1	70.2
Switzerland	72.9	72.7	71.7	63.7	59.6	54.3
Germany	59.0	58.5	57.4	50.1	46.7	42.6
UK & Ireland	55.8	54.5	51.2	47.0	45.3	41.7
Spain	39.0	38.9	38.3	36.2	34.6	31.6
France	22.0	20.5	21.8	20.8	19.8	18.2
Portugal	15.9	16.0	15.5	14.5	14.0	12.9
Greece	10.3	10.8	10.8	10.3	9.8	9.1
Austria	9.7	9.1	9.3	8.9	8.5	7.9
Belgium	9.8	9.7	9.3	8.8	8.5	7.9
Netherlands	8.9	8.5	8.1	7.6	7.3	6.6
Poland	7.5	7.6	7.3	6.8	6.6	6.0
Yugoslavia	3.2	3.0	3.0	2.9	2.7	2.5
Other Europe	21.9	21.2	20.1	18.6	18.0	16.5
<b>Total Western Europe</b>	<b>540.2</b>	<b>546.8</b>	<b>546.5</b>	<b>476.1</b>	<b>473.2</b>	<b>444.0</b>
India	497.4	526.0	576.3	353.2	323.2	294.2
Pakistan	89.2	93.2	100.2	61.4	57.3	52.8
Bangladesh	35.5	36.5	32.9	19.7	17.8	16.0
Sri Lanka	5.0	5.0	5.0	3.0	2.7	2.6
<b>Total Indian sub-continent</b>	<b>627.1</b>	<b>660.7</b>	<b>714.5</b>	<b>437.3</b>	<b>400.9</b>	<b>365.6</b>
Mexico	27.4	27.4	27.4	23.3	21.5	19.6
Brazil	11.0	11.0	12.0	10.2	9.4	8.5
Other Latin America	26.3	26.5	26.6	22.6	20.9	19.0
<b>Total Latin America</b>	<b>64.7</b>	<b>64.8</b>	<b>66.0</b>	<b>56.1</b>	<b>51.9</b>	<b>47.1</b>

Continued overleaf

**Jewellery consumption, 2003-2008f (tonnes)**

	2003	2004	2005	2006	2007	2008f
Saudi Arabia	143.9	152.3	160.0	116.8	123.4	123.7
Egypt	74.0	76.7	85.8	56.4	61.2	62.4
Iran	49.1	49.7	55.6	44.0	46.1	47.1
Iraq	55.5	54.1	60.3	39.0	42.4	43.2
UAE	36.2	40.4	43.1	31.3	34.9	34.9
Lebanon	31.9	34.3	38.1	24.6	26.5	27.0
Syria	29.6	32.2	34.4	23.4	26.0	26.5
Yemen	29.4	31.3	33.3	22.8	24.6	25.1
Kuwait	25.8	27.7	30.8	20.3	22.6	23.0
Jordan	25.6	27.3	29.0	18.6	20.1	20.5
Israel	1.7	1.8	1.8	1.5	1.5	1.4
<b>Total Middle East</b>	<b>502.6</b>	<b>527.7</b>	<b>572.3</b>	<b>398.7</b>	<b>429.3</b>	<b>434.8</b>
USA	386.7	378.5	372.2	334.5	317.8	291.1
Canada	17.9	17.7	17.7	16.8	15.8	14.5
<b>Total North America</b>	<b>404.6</b>	<b>396.2</b>	<b>390.0</b>	<b>351.3</b>	<b>333.6</b>	<b>305.5</b>
<b>World total</b>	<b>2,808.3</b>	<b>2,878.2</b>	<b>2,995.6</b>	<b>2,275.8</b>	<b>2,227.0</b>	<b>2,152.0</b>

Source: VM Group

**Gold usage in electronics, 2003-2008f (tonnes)**

	2003	2004	2005	2006	2007	2008f
Japan	118.5	125.0	131.6	135.5	146.3	150.7
South Korea	46.2	55.5	66.6	69.2	74.8	77.0
Singapore	11.9	13.5	15.4	15.6	16.9	17.4
China	1.7	2.5	3.8	5.7	7.4	8.5
Taiwan	3.1	3.3	3.4	3.6	3.9	4.0
<b>Total Asia</b>	<b>181.4</b>	<b>199.8</b>	<b>220.8</b>	<b>229.6</b>	<b>249.2</b>	<b>257.6</b>
Australia	0.5	0.5	0.5	0.6	0.6	0.6
<b>Total Australasia</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.6</b>	<b>0.6</b>
Russia	15.6	16.0	16.5	17.2	18.6	19.1
<b>Total Eastern Europe</b>	<b>15.6</b>	<b>16.0</b>	<b>16.5</b>	<b>17.2</b>	<b>18.6</b>	<b>19.1</b>
Germany	10.8	10.8	10.9	11.3	12.2	12.6
France	8.3	8.9	9.5	9.9	10.6	11.0
Switzerland	8.4	8.9	9.4	9.8	10.6	10.9
UK & Ireland	5.7	5.5	5.4	5.6	6.0	6.2
Other Western Europe	7.3	7.4	7.5	7.8	8.4	8.6
<b>Total Western Europe</b>	<b>40.4</b>	<b>41.5</b>	<b>42.6</b>	<b>44.3</b>	<b>47.9</b>	<b>49.3</b>
India	0.1	0.1	0.1	0.1	0.1	0.1
<b>Total Indian sub-continent</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>
Brazil	1.3	1.4	1.4	1.5	1.6	1.6
Mexico	0.1	0.1	0.1	0.1	0.2	0.2
<b>Total Latin America</b>	<b>1.5</b>	<b>1.5</b>	<b>1.5</b>	<b>1.6</b>	<b>1.7</b>	<b>1.8</b>
Israel	0.1	0.1	0.1	0.1	0.1	0.2
<b>Total Middle East</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.2</b>
USA	70.1	72.2	74.4	77.4	83.5	86.0
Canada	0.7	0.7	0.7	0.7	0.8	0.8
<b>Total North America</b>	<b>70.8</b>	<b>72.9</b>	<b>75.1</b>	<b>78.1</b>	<b>84.3</b>	<b>86.9</b>
<b>World total</b>	<b>310.4</b>	<b>332.5</b>	<b>357.3</b>	<b>371.6</b>	<b>402.6</b>	<b>415.5</b>

Source: VM Group

**Other end uses, 2003-2008f (tonnes)**

	2003	2004	2005	2006	2007	2008f
Japan	50.9	53.4	56.2	47.8	47.0	45.7
South Korea	12.5	13.6	14.7	13.5	13.9	13.9
Other Asia	2.8	2.9	3.1	2.8	2.9	3.0
<b>Total Asia</b>	<b>66.2</b>	<b>69.9</b>	<b>74.0</b>	<b>64.1</b>	<b>63.7</b>	<b>62.6</b>
Australia	0.5	0.5	0.5	0.5	0.4	0.5
<b>Total Australasia</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.4</b>	<b>0.5</b>
Turkey	50.6	60.7	72.8	48.9	46.9	49.6
Germany	23.2	23.7	24.1	22.6	22.1	21.2
Switzerland	15.5	16.6	17.7	16.2	16.5	16.1
Italy	7.9	7.9	7.8	7.2	7.2	7.1
France	6.4	6.5	6.7	6.0	6.3	6.2
Netherlands	5.2	5.9	6.7	6.4	6.1	5.8
Spain	2.3	2.5	2.7	2.5	2.6	2.5
Other Europe	4.6	4.7	4.7	4.4	4.3	4.2
<b>Total Western Europe</b>	<b>115.8</b>	<b>128.4</b>	<b>143.2</b>	<b>114.1</b>	<b>112.0</b>	<b>112.7</b>
India	68.4	83.7	102.5	76.9	76.1	77.4
Pakistan	2.1	2.2	2.3	2.2	2.0	2.2
<b>Total Indian sub-continent</b>	<b>70.5</b>	<b>85.9</b>	<b>104.8</b>	<b>79.0</b>	<b>78.0</b>	<b>79.5</b>
Brazil	8.2	9.1	10.1	9.2	9.6	9.4
Other Latin America	1.0	1.0	1.0	0.9	0.9	0.9
<b>Total Latin America</b>	<b>9.1</b>	<b>10.1</b>	<b>11.1</b>	<b>10.1</b>	<b>10.5</b>	<b>10.3</b>
United Arab Emirates	15.4	18.5	22.2	13.3	12.1	13.3
Other Middle East	5.8	5.9	6.1	5.8	5.3	5.8
<b>Total Middle East</b>	<b>21.2</b>	<b>24.4</b>	<b>28.3</b>	<b>19.1</b>	<b>17.4</b>	<b>19.1</b>
USA	31.1	30.8	30.6	28.3	28.6	27.7
Canada	0.3	0.3	0.3	0.3	0.3	0.3
<b>Total North America</b>	<b>31.4</b>	<b>31.1</b>	<b>30.9</b>	<b>28.5</b>	<b>28.8</b>	<b>27.9</b>
<b>World total</b>	<b>314.6</b>	<b>350.3</b>	<b>392.8</b>	<b>315.4</b>	<b>311.0</b>	<b>312.6</b>

Source: VM Group

Note: Includes Dental Alloys, Non-Legal Tender Coins and Other Industrial Uses

**Legal tender coins, 2003-2008f (tonnes)**

	2003	2004	2005	2006	2007e	2008f
South Africa	2.2	2.9	3.0	3.0	2.7	3.7
<b>Total Africa</b>	<b>2.2</b>	<b>2.9</b>	<b>3.0</b>	<b>3.0</b>	<b>2.7</b>	<b>3.7</b>
Japan	0.0	0.0	0.0	0.0	0.0	0.0
Singapore	0.0	0.0	0.0	0.0	0.0	0.0
South Korea	0.0	0.0	0.0	0.0	0.0	0.0
Taiwan	0.0	0.0	0.0	0.0	0.0	0.0
Thailand	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Asia</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Australia	3.4	5.2	6.0	6.0	5.5	7.3
<b>Total Australasia</b>	<b>3.4</b>	<b>5.2</b>	<b>6.0</b>	<b>6.0</b>	<b>5.5</b>	<b>7.3</b>
Austria	6.5	7.0	7.5	7.5	6.3	8.4
Belgium	0.0	0.0	0.0	0.0	0.0	0.0
France	0.0	0.0	0.0	0.0	0.0	0.0
Italy	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	2.5	2.4	2.5	2.5	2.3	3.0
Switzerland	0.0	0.0	0.0	0.0	0.0	0.0
Turkey	45.0	45.0	55.0	50.0	41.7	55.8
UK & Ireland	2.5	2.4	3.0	3.0	2.7	3.7
Yugoslavia	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Europe</b>	<b>56.5</b>	<b>56.8</b>	<b>68.0</b>	<b>63.0</b>	<b>52.9</b>	<b>70.9</b>
Chile	0.0	0.0	0.0	0.0	0.0	0.0
Mexico	0.0	0.0	0.0	0.0	0.0	0.0
Venezuela	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Latin America</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
Canada	7.4	8.9	10.0	7.2	8.7	11.7
USA	15.1	16.7	14.0	18.2	21.9	29.4
<b>Total North America</b>	<b>22.5</b>	<b>25.6</b>	<b>24.0</b>	<b>25.4</b>	<b>30.7</b>	<b>41.1</b>
<b>World total</b>	<b>84.6</b>	<b>90.5</b>	<b>101.0</b>	<b>97.4</b>	<b>91.8</b>	<b>122.9</b>

Source: VM Group

## Financials: prices, volatilities and lease rates

### Gold prices in various currencies, average, 1994-2008

	\$/oz	Euro/oz	Rand/kg	Yen/gr	A\$/oz
1994	384.02	324.26	42,409	1,261	527.24
1995	384.18	296.91	43,343	1,162	517.53
1996	387.71	309.91	52,205	1,356	493.66
1997	331.37	293.10	47,377	1,287	444.82
1998	294.17	262.39	50,729	1,238	469.37
1999	278.73	261.45	53,006	1,018	432.90
2000	279.14	302.78	60,106	967	480.54
2001	271.10	302.82	74,496	1,056	524.66
2002	307.20	328.03	101,011	1,243	569.83
2003	363.32	321.06	85,026	1,346	558.89
2004	409.17	329.16	84,361	1,422	556.18
2005	444.45	358.28	90,829	1,577	583.45
2006	603.77	480.43	131,490	2,256	801.48
2007	695.39	506.78	151,713	2,542	828.53
Jan-06	549.86	453.22	107,284	2,040	732.45
Feb-06	555.00	464.84	108,872	2,104	748.98
Mar-06	557.09	463.05	111,832	2,101	767.01
Apr-06	610.65	496.60	119,188	2,292	828.26
May-06	675.39	528.48	136,993	2,425	884.22
Jun-06	596.15	470.65	133,408	2,197	805.93
Jul-06	633.71	499.37	144,107	2,357	842.66
Aug-06	632.59	493.90	140,804	2,357	829.01
Sep-06	598.19	469.92	142,911	2,253	791.81
Oct-06	585.78	464.15	143,601	2,233	776.96
Nov-06	627.83	487.10	145,867	2,367	812.45
Dec-06	629.79	476.66	142,321	2,370	801.89
Jan-07	631.17	486.00	145,481	2,444	806.83
Feb-07	664.75	507.94	152,744	2,573	848.98
Mar-07	654.90	494.31	154,266	2,469	826.17
Apr-07	679.37	502.21	154,376	2,597	819.98
May-07	666.86	493.73	149,995	2,590	808.69
Jun-07	655.49	488.32	150,450	2,584	778.48
Jul-07	665.30	484.90	148,702	2,596	767.82
Aug-07	665.41	488.69	153,807	2,499	802.42
Sep-07	712.65	511.95	162,228	2,636	840.38
Oct-07	754.60	530.15	163,353	2,811	838.76
Nov-07	806.25	549.30	173,674	2,875	901.03
Dec-07	803.20	551.44	176,025	2,897	922.29
Jan-08	889.60	604.22	200,081	3,079	1,008.60
Feb-08	922.30	624.89	226,839	3,175	1,009.79
Mar-08	968.43	623.46	248,043	3,139	1,047.77
Apr-08	909.70	577.21	226,708	3,002	976.94
May-08	888.66	571.35	217,201	2,980	936.09
Jun-08	889.49	571.32	226,821	3,056	935.02

Source: VM Group

---

**Inflation-adjusted gold price (in 2007 dollars)**


---

	<b>Nominal gold price (\$/oz)</b>	<b>US CPI (2007=100)</b>	<b>Real gold price (2007 dollars)</b>
1980	612.6	39.2	1,561.6
1981	459.9	43.3	1,062.8
1982	375.8	45.9	817.9
1983	424.1	47.4	894.4
1984	360.3	49.5	728.4
1985	317.2	51.2	619.2
1986	367.7	52.2	704.7
1987	446.5	54.1	825.5
1988	437.0	56.3	775.8
1989	381.4	59.0	646.1
1990	383.5	62.2	616.4
1991	362.2	64.8	558.5
1992	343.7	66.8	514.5
1993	359.8	68.8	522.9
1994	384.1	70.6	544.4
1995	384.2	72.6	529.5
1996	387.7	74.7	519.0
1997	331.2	76.4	433.5
1998	294.2	77.6	379.0
1999	278.6	79.3	351.3
2000	279.1	82.0	340.5
2001	271.1	84.3	321.5
2002	307.2	85.7	358.7
2003	363.3	87.6	414.7
2004	409.2	89.9	455.0
2005	444.4	93.0	478.0
2006	603.8	96.0	629.0
2007	695.4	100.0	695.4

---

Source: VM Group

---

**Price volatility, 1994-2008 (%)**


---

	<b>Daily</b>	<b>1M</b>	<b>3M</b>	<b>6M</b>	<b>12M</b>
1994	6.47	8.12	8.35	9.19	9.89
1995	4.22	5.70	5.74	5.91	6.05
1996	4.44	5.45	5.52	5.66	5.80
1997	7.52	9.80	9.78	9.23	8.81
1998	9.29	12.32	12.80	12.95	12.86
1999	9.44	13.41	13.87	13.10	12.64
2000	8.57	12.37	13.40	15.94	17.13
2001	8.17	11.41	11.83	11.89	11.75
2002	10.42	12.72	12.78	13.00	13.04
2003	11.53	15.69	16.13	15.79	15.31
2004	11.32	14.05	14.03	14.37	14.77
2005	9.31	11.60	11.39	11.27	12.29
Jan-06	19.03	27.56	20.71	16.71	13.93
Feb-06	13.08	20.20	22.01	18.11	14.72
Mar-06	19.87	19.43	22.54	19.23	15.49
Apr-06	13.52	19.85	19.90	20.12	16.30
May-06	29.17	26.75	22.80	22.21	17.91
Jun-06	20.07	34.84	29.39	26.08	20.64
Jul-06	24.06	26.07	30.81	25.96	21.76
Aug-06	18.04	26.86	29.43	26.63	22.96
Sep-06	16.64	20.59	24.84	26.84	23.55
Oct-06	21.24	23.16	23.52	27.24	24.13
Nov-06	13.17	18.38	21.11	25.54	24.36
Dec-06	12.33	14.56	19.11	22.14	23.92
Jan-07	12.33	17.02	16.60	20.44	23.24
Feb-07	12.48	15.50	15.84	18.55	23.02
Mar-07	14.13	19.31	17.41	18.25	22.94
Apr-07	8.79	10.77	15.61	16.23	22.47
May-07	9.91	12.99	14.70	15.25	20.49
Jun-07	7.51	12.26	12.03	14.93	18.62
Jul-07	7.56	10.82	12.08	13.96	17.15
Aug-07	8.27	11.89	11.59	13.20	16.01
Sep-07	11.34	10.74	11.38	11.73	15.03
Oct-07	12.92	14.04	12.52	12.37	14.14
Nov-07	17.42	17.76	14.51	13.36	14.39
Dec-07	17.10	22.01	19.00	15.59	15.23
Jan-08	11.02	17.04	19.90	16.52	15.27
Feb-08	20.38	20.13	19.63	15.71	15.60
Mar-08	13.95	22.15	19.82	19.32	16.12
Apr-08	23.90	30.02	24.08	21.84	17.84
May-08	16.88	22.46	24.91	22.48	18.75
Jun-08	16.79	19.55	24.73	22.05	19.10

Source: VM Group

**Lease rates, 1993-2007 (% p.a.)**

	1-month	3-month	6-month	12-month
1993	0.74	0.86	0.94	1.15
1994	0.54	0.66	0.75	0.91
1995	1.74	1.69	1.59	1.59
1996	1.52	1.71	1.90	2.17
1997	1.84	1.90	1.97	2.12
1998	2.60	2.69	2.94	3.27
1999	1.71	1.90	2.05	2.27
2000	0.60	0.82	1.04	1.50
2001	1.29	1.33	1.42	1.68
2002	0.26	0.40	0.58	0.94
2003	0.09	0.14	0.23	0.41
2004	0.08	0.11	0.15	0.25
2005	0.11	0.11	0.13	0.18
2006	0.09	0.11	0.12	0.12
Jan-06	0.11	0.11	0.12	0.15
Feb-06	0.09	0.12	0.15	0.18
Mar-06	0.13	0.11	0.13	0.15
Apr-06	0.12	0.11	0.13	0.15
May-06	0.09	0.10	0.10	0.11
Jun-06	0.11	0.12	0.13	0.15
Jul-06	0.09	0.08	0.09	0.11
Aug-06	0.05	0.06	0.08	0.08
Sep-06	0.06	0.09	0.09	0.08
Oct-06	0.07	0.11	0.13	0.11
Nov-06	0.09	0.12	0.12	0.10
Dec-06	0.11	0.12	0.13	0.12
Jan-07	0.10	0.13	0.16	0.18
Feb-07	0.10	0.13	0.17	0.19
Mar-07	0.11	0.15	0.18	0.17
Apr-07	0.11	0.14	0.17	0.17
May-07	0.11	0.14	0.17	0.20
Jun-07	0.11	0.13	0.17	0.21
Jul-07	0.11	0.14	0.17	0.20
Aug-07	0.19	0.23	0.28	0.29
Sep-07	0.23	0.28	0.33	0.33
Oct-07	0.20	0.32	0.35	0.37
Nov-07	0.20	0.36	0.39	0.33
Dec-07	0.41	0.38	0.47	0.45
Jan-08	0.16	0.22	0.34	0.33
Feb-08	0.21	0.29	0.46	0.45
Mar-08	0.14	0.27	0.43	0.45
Apr-08	0.15	0.22	0.40	0.46
May-08	0.24	0.34	0.47	0.55
Jun-08	0.18	0.30	0.47	0.52

Source: VM Group

**Official sector by region, 2001-2008 (tonnes)**

	2003	2004	2005	2006	2007	2008f
Africa	420	420	420	420	420	417
Asia	2,356	2,326	2,262	2,258	2,247	2,239
Australasia	80	80	80	80	80	80
Eastern Europe	926	930	935	959	962	997
Western Europe	14,461	14,051	13,522	13,194	12,694	12,393
Indian sub-continent	432	432	432	432	432	432
Latin America	516	571	571	565	565	562
Middle East	1,092	1,072	1,082	1,162	1,162	1,176
North America	8,140	8,140	8,140	8,138	8,138	8,138
IMF/BIS	3,411	3,425	3,418	3,402	3,368	3,358
<b>Total</b>	<b>31,833</b>	<b>31,444</b>	<b>30,861</b>	<b>30,608</b>	<b>30,067</b>	<b>29,790</b>

Source: IMF, national central banks websites, VM Group

**Official sector purchases, 2003-2008 (tonnes)**

	2003	2004	2005	2006	2007	2008f
Africa	0.0	0.0	0.0	0.0	0.2	0.0
Asia	7.0	3.1	3.7	6.7	0.8	5.0
Australasia	0.0	0.0	0.0	0.0	0.0	0.0
Eastern Europe	3.5	3.4	5.4	25.3	51.9	38.0
Western Europe	0.0	0.0	0.0	0.0	0.8	0.0
Indian sub-continent	0.0	0.0	0.0	0.0	0.0	0.0
Latin America	28.3	54.8	0.0	0.0	0.0	0.0
Middle East	0.0	0.0	30.0	100.0	0.0	14.0
North America	0.0	0.0	0.0	0.0	0.0	0.0
IMF/BIS	0.0	0.0	0.2	0.0	0.0	0.0
<b>Total</b>	<b>38.8</b>	<b>61.3</b>	<b>39.1</b>	<b>132.0</b>	<b>53.5</b>	<b>57.0</b>

Source: IMF, national central banks websites, VM Group

**Official sector sales, 2003-2008f (tonnes)**

	2003	2004	2005	2006	2007	2008f
Africa	57.5	0.0	0.0	0.0	0.0	3.0
Asia	19.8	34.0	66.9	11.0	12.1	13.0
Australasia	0.0	0.0	0.0		0.0	0.0
Eastern Europe	5.1	0.0	0.0	1.2	48.9	3.0
Western Europe	453.7	410.0	529.0	328.3	499.9	301.3
Indian sub-continent	0.0	0.0	0.0		0.0	0.0
Latin America	0.0	0.0	0.0	6.0	0.0	3.0
Middle East	20.0	20.0	20.0	20.0	0.0	0.0
North America	15.2	0.0	0.0	2.0	0.0	0.0
IMF/BIS	2.0	0.0	7.0	16.0	34.3	10.0
<b>Total</b>	<b>573.3</b>	<b>464.0</b>	<b>622.9</b>	<b>384.5</b>	<b>595.2</b>	<b>333.3</b>

Source: IMF, national central banks websites, VM Group

**Gold lending, 2003-2008f (tonnes) (\*)**

	2003	2004	2005	2006	2007	2008f
Africa	123	123	107	104	92	83
Asia	648	648	536	520	438	394
Australasia	76	76	76	72	64	58
Eastern Europe	375	405	382	345	306	276
Western Europe	2,627	2,218	2,002	1,723	1,453	1,100
Indian sub-continent	100	100	95	94	94	85
Latin America	299	299	277	251	231	184
Middle East	476	444	356	294	232	150
North America	2	2	2	1	1	1
<b>Total</b>	<b>4,724</b>	<b>4,315</b>	<b>3,831</b>	<b>3,405</b>	<b>2,912</b>	<b>2,330</b>

Source: IMF, national central banks websites, VM Group. Note the IMF does not lend gold, so the BIS has been included in estimates of Western European lending in order to not identify its exact level.

(\*) Includes estimate of private lending.

## Other

### Hedging, delta-adjusted, end-period, 2003-2007 (tonnes)

	2003	2004	2005	2006	2007
<b>Global</b>					
Net forwards	1,731	1,489	1,307	922	561
Net calls	290	252	296	292	252
Other products	123	44	52	36	3
Net puts	120	22	13	7	18
<b>Total hedge impact</b>	<b>2,264</b>	<b>1,808</b>	<b>1,667</b>	<b>1,256</b>	<b>835</b>
<i>Change</i>	<i>(341)</i>	<i>(456)</i>	<i>(141)</i>	<i>(410)</i>	<i>(421)</i>
<b>Americas</b>					
Net forwards	976	849	764	503	325
Net calls	90	62	54	24	13
Other products	33	29	25	10	3
Net puts	41	22	5	3	2
<b>Total hedge impact</b>	<b>1,140</b>	<b>963</b>	<b>847</b>	<b>541</b>	<b>343</b>
<i>Change</i>	<i>(257)</i>	<i>(176)</i>	<i>(116)</i>	<i>(307)</i>	<i>(197)</i>
<b>Africa</b>					
Net forwards	381	235	184	129	119
Net calls	159	162	214	237	217
Other products	0	0	0	0	0
Net puts	5	-6	0	(9)	(4)
<b>Total hedge impact</b>	<b>546</b>	<b>392</b>	<b>398</b>	<b>358</b>	<b>332</b>
<i>Change</i>	<i>(99)</i>	<i>(154)</i>	<i>7</i>	<i>(40)</i>	<i>(26)</i>
<b>Australias</b>					
Net forwards	309	357	317	249	93
Net calls	40	27	21	14	10
Other products	87	15	27	25	0
Net puts	73	6	5	8	20
<b>Total hedge impact</b>	<b>508</b>	<b>404</b>	<b>370</b>	<b>297</b>	<b>124</b>
<i>Change</i>	<i>(35)</i>	<i>(104)</i>	<i>(35)</i>	<i>(73)</i>	<i>(174)</i>
<b>Europe</b>					
Net forwards	65	48	42	41	28
Net calls	1	0	6	16	12
Other products	3	0	0	0	0
Net puts	2	0	3	4	(1)
<b>Total hedge impact</b>	<b>70</b>	<b>48</b>	<b>51</b>	<b>61</b>	<b>36</b>
<i>Change</i>	<i>50</i>	<i>(22)</i>	<i>3</i>	<i>10</i>	<i>(25)</i>

Source: "The Fortis Hedging and Financial Gold Report", by Haliburton Mineral Services and VM Group

**Hedging, committed, end-period, 2003-2007 (tonnes)**

	2003	2004	2005	2006	2007
<b>Global</b>					
Net forwards	1,797	1,517	1,327	934	571
Calls sold	456	391	407	417	306
Calls bought	71	64	57	56	20
Other products	149	49	53	36	3
<b>Total committed</b>	<b>2,331</b>	<b>1,893</b>	<b>1,731</b>	<b>1,331</b>	<b>861</b>
<i>Change</i>	<i>(443)</i>	<i>(438)</i>	<i>(162)</i>	<i>(400)</i>	<i>(470)</i>
Puts bought	525	253	241	196	201
Puts sold	65	40	23	50	47
<b>Americas</b>					
Net forwards	1,011	866	776	510	332
Calls sold	109	76	65	48	21
Calls bought	0	3	1	4	3
Other products	40	35	26	10	3
<b>Total committed</b>	<b>1,160</b>	<b>973</b>	<b>866</b>	<b>565</b>	<b>354</b>
<i>Change</i>	<i>(312)</i>	<i>(187)</i>	<i>(107)</i>	<i>(301)</i>	<i>(211)</i>
Puts bought	237	151	93	57	26
Puts sold	17	5	2	0	0
<b>Africa</b>					
Net forwards	394	239	187	131	119
Calls sold	280	271	301	323	260
Calls bought	71	61	56	52	17
Other products	0	0	0	0	0
<b>Total committed</b>	<b>603</b>	<b>448</b>	<b>433</b>	<b>402</b>	<b>362</b>
<i>Change</i>	<i>(122)</i>	<i>(154)</i>	<i>(16)</i>	<i>(31)</i>	<i>(40)</i>
Puts bought	91	75	84	59	1
Puts sold	49	35	21	50	47
<b>Australias</b>					
Net forwards	324	361	319	252	91
Calls sold	64	44	28	16	11
Calls bought	0	0	0	0	0
Other products	106	15	28	26	0
<b>Total committed</b>	<b>494</b>	<b>420</b>	<b>375</b>	<b>294</b>	<b>102</b>
<i>Change</i>	<i>(60)</i>	<i>(74)</i>	<i>(45)</i>	<i>(81)</i>	<i>(192)</i>
Puts bought	187	27	48	51	152
Puts sold	0	0	0	0	0
<b>Europe</b>					
Net forwards	68	51	44	41	29
Calls sold	4	0	13	29	14
Calls bought	0	0	0	0	0
Other products	3	0	0	0	0
<b>Total committed</b>	<b>74</b>	<b>51</b>	<b>58</b>	<b>70</b>	<b>43</b>
<i>Change</i>	<i>52</i>	<i>(23)</i>	<i>6</i>	<i>12</i>	<i>(27)</i>
Puts bought	9	0	16	17	22
Puts sold	0	0	0	0	0

Source: "The Hedge Book", by Mitsui Global Precious Metals, Haliburton Mineral Services, VM Group

**Exchange traded funds, annual offtake, 2003-2008f (tonnes)**

	2003	2004	2005	2006	2007	2008f
Africa	0.0	3.0	4.3	2.6	13.5	5.0
Australasia	8.4	(1.0)	0.9	2.1	5.8	0.0
India	0.0	0.0	0.0	0.0	4.4	2.0
Europe	24.5	27.6	8.5	36.4	50.7	90.0
North America	0.0	94.9	178.2	212.3	185.4	100.0
<b>World total</b>	<b>32.9</b>	<b>124.5</b>	<b>191.9</b>	<b>253.3</b>	<b>259.8</b>	<b>197.0</b>

Source: Company websites, VM Group analysis.

**COMEX speculation futures and options, end-period, 1994-June 2008 (tonnes)**

	Open interest	Large speculators net long (futures)	Small speculators net long (futures)	Total net long
1994	559	(125)	5	(120)
1995	439	7	45	52
1996	590	(130)	(5)	(135)
1997	553	(159)	21	(138)
1998	506	(108)	(8)	(116)
1999	487	(90)	34	(56)
2000	357	(44)	25	(20)
2001	345	(9)	46	37
2002	644	185	140	325
2003	867	350	147	497
2004	1,029	307	121	428
2005	996	481	108	589
2006	1,294	212	109	321
Jan-06	1,326	433	87	520
Feb-06	1,340	396	92	488
Mar-06	1,282	375	90	465
Apr-06	1,448	402	117	519
May-06	1,261	316	118	434
Jun-06	1,195	266	95	361
Jul-06	1,345	316	118	434
Aug-06	1,216	273	92	365
Sep-06	1,266	222	75	292
Oct-06	1,331	201	85	286
Nov-06	1,318	248	118	366
Dec-06	1,294	212	109	321
Jan-07	1,326	312	110	422
Feb-07	1,659	442	130	572
Mar-07	1,360	421	122	543
Apr-07	1,569	416	118	534
May-07	1,511	295	74	369
Jun-07	1,484	196	64	260
Jul-07	1,323	252	99	350
Aug-07	1,268	240	67	308
Sep-07	1,714	541	106	647
Oct-07	2,095	618	114	732
Nov-07	1,939	545	94	639
Dec-07	2,089	620	121	741
Jan-08	2,006	640	122	762
Feb-08	2,011	651	133	784
Mar-08	1,932	547	95	642
Apr-08	1,726	500	77	577
May-08	1,637	596	83	679
Jun-08	1,773	584	121	705

Source: Commodity Futures Trading Commission

## Weights and measures

---

### Chemical properties

---

Atomic weight	196.967
Atomic number	79
Chemical symbol	Au
Melting point deg C	1,063
Hardness (mohs)	2.5-3.0
Boiling point deg C	2,966
Specific gravity gr/cubic cm	19.32
Hardness	25
Tensile strength km/Sq mm	11.9

---

Source: VM Group

---

### Purity (caratage) – In parts per 1,000

---

24 carat	1,000	
	999.9	Termed four nines
	995	London good delivery
22 carat	916	Common caratage for jewellery in Middle East & Asia
18 carat	750	Common caratage for jewellery throughout Europe
14 carat	583	Common caratage for jewellery in the USA
10 carat	417	Lowest acceptable for jewellery in USA
9 carat	375	Common caratage for jewellery in the UK
8 carat	333	Lowest acceptable caratage in parts of Europe
1 carat	41.7	

---

Source: VM Group

---

### Measures

---

1 troy ounce	= 31.103 grammes
	= 408.6 grains
	= 1.097 oz avoirdupois
	= 20 pennyweights
1 metric tonne	= 32.151 troy ounces
	= 1.102 short tons
1 short ton	= 0.893 long tonnes
	= 2,000 Pounds
1 pound	= 14.58 troy ounces
1 grain	= 0.0648 grammes
	= 0.002083 troy ounces
1 gramme	= 14.43 grains
1 pennyweight	= 24 grains
1 kilogramme	= 32.1507 troy ounces
1 oz avoirdupois	= 0.9115 troy ounces

---

Source: VM Group

## Glossary

### A

- **Accelerated supply:** Gold reaching the market through lending and leasing before it is physically produced.
- **American style:** (option) that can be exercised at any stage during its life, in other words at or before expiration date. Contrast **European style**.
- **Asian options:** A **history-dependent** option where the outcome is reliant not only on whether or not the option is **in-the-money** at expiry but also depends on the average price of the underlying throughout the option life. These options are used mostly (in the base metal markets) to reduce exposure or incentives to manipulate the underlying price at expiry. Asian options are also used by market participants who are obliged to have frequent exposure to the underlying asset over time. The options are then useful in capping the overall cost of the physical exposure and are ideal for producers.
- **At-the-money option:** An option with a strike price equal to that of the current price.

### B

- **Backwardation:** A market situation where the spot price trades at a premium to the forward price. Opposite of **contango**.
- **Barrier options:** Unlike standard **European options** where the income depends only on the price of the underlying at expiration, barrier options are **history-dependent**. In other words, their outcome depends on the performance of the price of the underlying during the life of the option and whether that price breaches some predetermined barrier or level. See 'in' barrier and 'out' barrier options.
- **Binary options:** Unlike standard options which have a constant income, binary options have variable (usually all or nothing) pay backs depending on whether or not the price of the underlying meets some pre-agreed condition. Binary options can be either **history-dependent** or **history-independent**.
- **BIS:** Bank for International Settlements.
- **Bonds:** Means of raising debt through the capital markets. See also Gold-backed bonds.

### C

- **Call option:** Option giving the purchaser the right but not the obligation to buy gold at a predetermined (strike) price.
- **CBOT:** The Chicago Board of Trade.
- **CCA:** Comex Clearing Association.
- **CFTC:** Commodity Futures Trading Commission (the futures and options watch-dog).
- **CIS:** Commonwealth of Independent States (former Soviet Union).
- **Collars:** Options which have the same pay-out as the standard call except that the upside is not unlimited. It is subject to a maximum. The option buyer forgoes any further income above this maximum.
- **COMEX:** The Commodity Exchange in New York.
- **Compound options:** These are options on options. The underlying asset is an option rather than a tangible commodity or security. Valuation of the option is complicated by the fact that two expiry dates must be accounted for: the time to expiration of the compound and the time to expiration of the underlying option.
- **Contango:** A market situation where the spot price is lower than the forward quotation; the differential representing the carrying (financing) costs and prevailing interest rates. Opposite of backwardation.
- **Cost curve:** Graphical representation of the costs of producing a metal for an entire primary industry. Usually cumulative output expressed in percent plotted against unit operating costs.
- **Coupon:** Annual interest rate associated with capital market bond issues.

**E**

- **EGA:** European Gold Agreement.
- **EMCF:** European Monetary Co-operation Fund.
- **ETF:** Exchange Traded Fund.
- **European style:** An option that can only be exercised on the date of expiry.
- **Exercising: (An Option)** Whereby the option purchaser holds the writer (seller) of an option to the agreed contract.
- **Exotic options:** Generic term for the more sophisticated option strategy which has features over and above the basic contracts.

**G**

- **GOFO:** Reuters screen code for the daily gold lease rates.
- **Gold backed bonds:** Debt raised through the capital markets issued with a gold options alternative to enhance the value/attraction of the investment.
- **Gold loan:** A means of raising capital for project financing which involves monetising gold.

**I**

- **IFS:** International Financial Statistics.
- **IMF:** International Monetary Fund.
- **IMM:** International Monetary Market.
- **'In' barrier options:** Options which are paid for at the time of the initial transaction but are not received until a specified price level (the barrier or the knock-in boundary) is broken. If the barrier is broken at some stage during the option's life, then the buyer receives a standard **European** option with a **strike** price and time to expiration. If the barrier is not broken, then at expiry, the holder receives a cash rebate.
- **In-the-money option:** An option which has a positive **intrinsic value** is said to be in the money. In the case of a **call**, it is in the money when the **strike** price is lower than the current price. A **put** option is in the money when the **strike** price is higher than the current price.
- **Intrinsic value** (of an option): The difference between the strike price and current price of the underlying commodity.

**K**

- **Knock-out options: Exotic option** whereby the contract is cancelled if the spot price breaks through an agreed price. See up-and-out puts and down-and-out calls. The knock-out option is priced differently since it can explode or be cancelled while theoretically it still has **time value**.

**L**

- **Limit down:** Arbitrary price level below which trading on a Futures and Options Exchange ceases during that trading day. Imposed to prevent very sharp price declines in futures prices and are adjusted from time to time at the discretion of the Exchange. See Limits.
- **Limits:** Arbitrary price barriers imposed by Futures and Options Exchanges to limit severe price movements during a trading day. There are no limits in the spot market. See Limit Up and Limit Down.
- **Limit up:** Arbitrary price level above which trading on a Futures and Options Exchange ceases during that trading day. Imposed to prevent very sharp price increases in futures prices and are adjusted from time-to-time at the discretion of the Exchange.
- **Liquidity:** The volume of business or turnover on an exchange or any market forum; can be applied to either the paper market or the physical.
- **Loco:** Physical location of metal. Unless otherwise stated, price quotations imply delivery loco London.
- **Long:** To be long of a commodity or associated futures or options contract is to have been a buyer. Contrast **short**.

**M**

- **Maturity date:** Date on which option matures; when it is either exercised or it expires worthless. Also known as expiration date.
- **Margin:** The cash deposit against a paper contract payable as a guarantee. An initial payment is usually made and thereafter further margin requirements may have to be met depending on the performance of the contract throughout its life.

**N**

- **Naked options:** Option granted and left unhedged or exposed to potential exercising.

**O**

- **Open outcry:** Method of trading any commodity where dealers face each other in a dealing ring or pit and there is direct communication. Contrast: **Screen Trading**.
- **Out-of-the-money (option):** An option that has no **intrinsic value** is said to be out-of-the-money. A **call** is out-of-the-money when the **strike price** is higher than the current price. A **put** is when the **strike price** is lower than the current price.
- **OTC:** Over-the-counter; term used to describe an option that is written and traded through principals rather than an exchange.
- **'Out' Barrier:** Options which are paid for immediately and exist until, during the option life, a predetermined barrier is broken after which the options are rendered null and void – they cease to exist. If the barrier is not breached, the holder receives standard **European** options. If the barrier is broken and the options are extinguished, the holder is then paid a rebate.

**P**

- **Principal-to-principal:** Bullion transactions executed directly between the client and the market makers without being channelled through an exchange. Used primarily by market participants who have actual physical transactions to complete rather than the speculators. Speculative business tends to be channelled via the exchanges.
- **Premium:** The cost which the buyer of an option pays to the writer or seller of the option; normally only a very small fraction of the value of the underlying commodity.
- **Put option:** Option giving the purchaser the right but not the obligation to sell gold at a particular **strike price**.

**R**

- **Reuters:** International screen-based news agency widely used by all metal and foreign exchange market participants.

**S**

- **Screen trading:** Method of trading via computer screens and telephones in which there is no direct contact between dealers. Contrast: **open outcry**.
- **SDR:** Special Drawing Right.
- **Short:** To be short of a commodity or associated futures or options contract is to have been a seller. Contrast **long**.
- **Spot deferred:** Hybrid forward contract offering floating interest rates and no fixed delivery. More flexible than a conventional forward but without the cost of an option.
- **Spot market:** The immediate market where delivery obligations usually occur no more than 2 days after the transaction.
- **Strike price:** The agreed price at which the option can be exercised which will be equal to, higher or lower than the current price of the underlying.
- **Swap:** A spot sale with a simultaneous equal forward purchase of equal tonnage. This is the definition of a gold or bullion swap which may differ from the term used by the foreign exchange markets.

- **Synthetic gold loan:** A means of raising finance using the gold forward market but which does not result in the monetising of physical metal.

**T**

- **Time value:** Option value associated with the time left to maturity since during its life an option can move in- and out-of-the-money.

**U**

- **Underlying:** Shortened term for the underlying commodity upon which futures and options are traded.

**V**

- **Volatility:** The rate of change in the price of the underlying commodity.

**W**

- **Writing options:** Selling someone else the right to buy or sell gold at a particular price.
- **10K report:** Set of audited annual accounts published and issued to shareholders. Differs from an annual report only in detail.

## Notes

## Notes

## Notes

## Disclaimer and copyright

The information, opinions and conclusions in this report were solely prepared by the VM Group (“VMG”). VMG has made all reasonable efforts to ensure that all information provided in this report is accurate and reliable at the time of inclusion (unless otherwise stated), however, there may be inadvertent and occasional errors and lack of accuracy or correctness, for which VMG cannot be held responsible. The VM Group and its employees have no obligation to inform the reader when opinions and information contained in this report change.

The VM Group make no representation or warranty, express or implicit, as to the accuracy or completeness of the contents of this report. This report is not and cannot be construed as an offer to sell, buy or trade any securities, equities, commodities or related derivative products and the report in no way offers investment advice. Therefore, the VM Group and its employees accept no liability for any direct, special, indirect, or consequential losses or damages, or any other losses or damages of whatsoever kind, resulting from whatever cause through the use of any information obtained either directly or indirectly from this report.

The contents of this report, all the information, opinions and conclusions contained are protected by copyright. This complete report may not be reproduced without the express consent of the VM Group. Extracts may be reproduced but only with the full and appropriate citing of the original source.

## About the VM Group

The VM Group comprises a team of dynamic, highly experienced analysts dedicated to understanding and explaining the current and future state of commodity markets – focusing on the precious and base metals markets but also covering energy, plastics and agribusiness. The VM Group team combines a range of skills with a collective 60 years' experience in the precious metals markets and all that this implies – a plethora of market contacts and personal networks of long-standing trust and wisdom.

Our clients include world-class mining companies for whom the VM Group specialises in proprietary research and others, including corporations, national governments and research bodies.

The VM Group team excels in macro-economic analysis, the generation of supply and demand scenarios, costs analysis, derivative research and price forecasting. Confidentiality, experience and independence are key elements of such advisory roles. Our aim is to assist those in need of external expertise, as well as those who wish to supplement their own in-house resources. With our extensive international contacts, we are able to broaden our services through links with experienced associates in related fields. For example, the VM Group maintains close working relationships with other highly regarded consultants such as Ted Reeve of Haliburton Mineral Services and Magnus Ericsson of the Raw Materials Group. The VM Group also produces for Fortis a range of monthly reports, the first covering all metals (base and precious) as well as plastics and more recently products covering energy, metals from an Asian perspective and agricommodities. All are available on a complimentary basis.

In July 2005, the VM Group launched MineLife a non-profit alliance of mining members committed to heightened social responsibility among host communities throughout Africa.

For further details, please email [info@virtualmetals.co.uk](mailto:info@virtualmetals.co.uk) or call us on +44 (0) 20 7487 3600. Visit our websites: [www.virtualmetals.co.uk](http://www.virtualmetals.co.uk) and [www.minelife.org](http://www.minelife.org).

## Fortis Commodities Contact List

### Commodities

Ian Downes (Executive Director Head of Fortis Commodity Derivatives)	+44 20 7444 8741
John King (Director & Head of LME & Precious Metals Brokerage GCG)	+44 20 3296 8330
Gery Schubert (Deputy Head of LME and Precious Metals)	+44 20 3296 8445
 Jonathan Parkman (Head, Agricommodities Brokerage)	 +44 20 3296 8407

### Global Commodities Group

Piet-Hein Ingen Housz (Global Head of Metals/SCF)	+31 10 401 67 93	
Rotterdam	Bram de Veer	+31 10 401 97 83
London	tbd	
New York	Antonio Nanez	+1 212 418 87 00
	Kimberly Oates	+1 212 418 87 00
Dubai	Silvan Doorenspleet	+97 14 363 57 40
Singapore	Ng Chuey Peng	+65 65 394 923
Shanghai	Steven Jin	+862 15 049 88 33
Hong Kong	Lee Mei	+852 28 47 94 20

### Structured Commodity Finance

Piet-Hein Ingen Housz (Global Head of Metals/SCF)	+31 10 401 67 93	
Carl Shipman (Managing Director) - London	+44 20 3296 8785	
New York	Juan Mejia	+1 212 340 53 56
Hong Kong	Christian Muchery	+852 39 20 33 40

# Global Markets Sales Contacts

**Adam Rose**

(Global Head Sales & Marketing Group)

## Investment Products Sales

Paul Wagner (Head Investment Products Sales) +352 42 10 44 50

### Institutionals

Belgium	Marc Sollie	+32 2 565 74 70
The Netherlands	Bert Veenstra	+31 20 535 74 54
Luxembourg	Paul Wagner	+352 42 10 44 50
France	François Girod	+33 1 55 67 90 56
UK-Ireland	Steven Harnie	+32 2 565 86 35
Italy	Franco Mora	+39 02 57 53 24 61
Spain	Jean-Louis Degand	+34 91 436 56 27

### Retail and Private Banking

Belgium	Alain Cadron	+32 2 565 75 50
The Netherlands	Bert Veenstra	+31 20 535 74 54
Luxembourg	André Wagner	+352 42 10 49 07

## Equities Sales

### Institutionals

Johan van Megesen (Head)		+32 2 565 96 22
Belgium	Koen Devos	+32 2 565 76 50
France	Philippe Barroso	+33 1 55 67 90 82
Luxembourg	André Wagner	+352 42 10 49 07
The Netherlands	Nils Ten Berg	+31 20 535 73 32
Spain (Domestic Sales)	Manuel Torres	+34 91 436 56 51
Spain (International Sales)	Luis Broto	+34 91 436 56 52
United Kingdom	Nils Ten Berg	+31 20 535 73 32
United States	Francis Grevers	+1 212 418 87 14

## Fixed Income/New Issues

Katherine Dior (Head)		+32 2 565 63 08
Syndication	Stefaan Van Langendonck (Head)	
		+32 2 565 69 40
Origination Corporate	Olivier Tasnier (Head)	+32 2 565 16 38
Origination Financials	Jacques Massin (Head)	+32 2 565 62 37
MTN Desk	Jacques Massin (Head)	+32 2 565 62 37
Securitisation	Kristof Moens (Head)	+32 2 565 85 43
Commercial Paper	Marie-Jose Rodriguez (Head)	
		+32 2 565 60 98

## Structured Products

Ludovic Plas (Head) +33 1 55 67 90 56

### Client Solutions Development

Dirk Baestaens (Head) +32 2 565 85 54

### Interest Rate Derivatives

Bernard Van Gils (Head) +32 2 565 87 61

### Forex Derivatives

Johann Barchéath (Head) +32 2 565 76 30  
+32 2 565 12 27

### Equity Derivatives

Fabian de Prey (Head) +32 2 565 78 82  
+32 2 565 91 05

### Credit Derivatives Structuring

+32 2 565 77 20

### Structured Product Services

Emmanuel Grimée (Head) +352 42 42 49 65  
+352 42 42 49 25

## Sales Treasury Products

Serge van Loenhout (European Head Sales Treasury) +44 207 444 86 63

### Corporate

Matthias Locker (Head)		+32 2 565 85 64
Belgium		+32 2 565 72 05
The Netherlands	Alfonso Vera Evertman	+31 20 535 71 66
Luxembourg	Manfred Hawelka	+352 42 10 49 42
France	David Alfandari	+33 1 55 67 90 05
Italy	Francesco Scotto	+39 02 57 53 24 64
Spain	Louis Veldman	+34 91 43 26 726
United Kingdom	Tim Kirkham	+44 20 73 98 93 53
Norway	Bjorn Kaaber	+47 23 11 49 60

### Financial Institutions

Laurent Leveque (Head)		+33 1 55 67 90 67
Belgium	Alex Devroye	+32 2 565 61 03
	Fiduciaries	+32 2 565 72 60
	Institutionals & Banks	+32 2 565 72 70
The Netherlands	Ronald Riko	+31 20 535 70 93
Luxembourg	Dominique Chaumaz	+352 42 10 47 00
Italy	Francesco Scotto	+39 02 57 53 24 64

### Mid-Caps

Belgium	Conrad Fieremans	+32 2 565 19 77
O/W Vlaanderen	Gerrit Bauwens	+32 2 565 78 57
Sud	Stéphane Christiaens	+32 2 565 78 56
Brussels/Public	Filip Moens	+32 2 565 70 40
VL Brabant/Limburg	Herwig Jaspers	+32 2 565 73 10
Antwerpen/Kempen	Jef Van Camp	+32 2 565 78 48
The Netherlands	Bart Solleveld	+31 20 535 71 84
Luxembourg	Thomas Kraemer	+352 42 10 46 00
Germany	Reinhold Beisler	+49 22 11 61 12 25
Austria	Alfred Buder	+43 181 10 43 81 58
Rest of Europe	Geert Blancke	+32 2 565 16 05
France	Muriel Flasse	+33 1 55 67 80 84
Spain	Jose Bravo Galisteo	+34 91 43 26 767
Portugal	Rui Lopes	+35 12 13 13 93 03
Italy	Marco Toja	+39 02 57 53 23 72
Poland		+48 225 66 99 04
Hungary	Attila Toth	+36 14 83 81 09
Czech Republic	Tomas Blazejovsky	+42 02 25 43 60 10
Denmark	Flemming Warhol-Rasmussen	+45 32 71 19 09
		+46 732 02 08 59
Sweden	Mats Cardemo	+30 210 9544 370
Greece	Marinos Danalatos	+41 58 322 09 70
Switzerland	Patrick Schaerer	+90 212 274 42 80
Turkey	Bahar Bezmez	+44 20 73 98 93 53
United Kingdom	Tim Kirkham	

### Sales Treasury Products - United States

Foreign Exchange	Richard Vullo	+1 212 838 14 87
Money Markets	Maurice Fiol	+1 212 644 15 75
Interest Rate Derivatives	Emanuel Sanz	+1 212 838 37 05

### Automated Trade and Service Desk

Marc Vidts		+32 2 565 71 10
ATS Desk		+32 2 565 73 00
Service Desk		+32 2 565 74 90
Netherlands	Wim Verwaal	+31 20 535 72 39

### Energy & Environmental Markets

Philippe Arickx (Head)		+32 2 565 75 60
Energy Europe, Brussels		+31 20 535 73 67
Energy Europe, Amsterdam		+31 20 535 72 02
Carbon Banking		

# Global Markets Research Contacts

**Han de Jong**  
(Global Head of Research)

## Economic Research

Guy Verberne (Head) +31 20 535 73 25

### The Netherlands

Joost Beaumont +31 20 535 74 31  
Peter de Bruin +31 20 535 70 38  
Nick Kounis +31 20 535 71 06  
Aline Schuiling +31 20 535 71 31

### Spain

Estefanía Ponte (Head) +34 91 436 55 37  
Diego Fernández +34 91 436 55 00

## Strategy

Françoise Bernard (Head) +32 2 565 83 02  
Arnaud Bornet (Forex & Money Markets Quant) +32 2 565 63 27  
Lucian Briciu (Forex & Money Markets) +32 2 565 68 99  
Frank Claus (Fixed Income) +32 2 312 16 81  
Alexandre Dieudonné (Forex & Money Markets) +32 2 565 69 67  
Sébastien Gillis (Fixed Income) +32 2 228 69 47  
Helios Padilla Mayer, Ph.D. (Commodities) +32 2 312 13 85  
Bart Robenek (Forex & Money Markets) +32 2 312 08 31

## Technical Analysis

Françoise Bernard (Head) +32 2 565 83 02  
Karel De Bie (Fixed Income/Forex/Commodities) +32 2 565 85 46  
Stephan Debruyne (Equities) +32 2 312 13 02

## Modelling

Peter Cauwels, Ph.D. (Head) +32 2 565 47 90  
Philippe Brimmel +32 2 565 40 29  
Stéphane Couteaux +32 2 312 10 30  
Alain Cram +32 2 565 60 52  
Michel Örün +31 20 535 74 82  
Herman van der Sluis +31 20 535 72 98  
Amjed Younis +32 2 565 31 00

## Credit Research

Hélène Séré (Head/Utilities & Energy) +33 1 55 67 72 83/+32 2 565 75 87  
Frédéric Atlan (Credit Strategy) +33 1 55 67 72 81/+32 2 565 86 06  
Jim Cheng (Structured Finance) +32 2 565 16 41  
Benoit Felliho (Banks/Insurance) +44 20 32 96 68 42  
Santosh K.C. (Structured Finance) +32 2 312 01 09  
Cyril Loiry (Telecom/Chemicals) +33 1 55 67 72 86  
Christine Passieux (Banks) +33 1 55 67 72 87  
Karine Petitjean (Consumer Non-Cyclical) +33 1 55 67 72 88  
Bertrand Rocher (Automotive) +33 1 55 67 72 84  
Olga Zubkova (Building & Basics/Utilities & Energy) +33 1 55 67 72 80

## Equity Research

Marc Pauwels (Head) +31 20 527 13 55

### Benelux

Michel Aupers (Head) +31 20 527 28 62  
Bart Jooris, CFA (Co-ordinator Belgium) +32 2 565 60 99  
Paul Andriessen (Mid & Small Caps) +31 20 527 21 82  
Maarten Bakker (Mid & Small Caps) +31 20 527 23 32  
Kurt De Baenst (Banks/Retail) +32 2 565 60 42  
Niels de Zwart (Semiconductors/Mid & Small Caps) +31 20 527 22 30  
Mark Gevens (Industrials) +32 2 565 60 71  
Tim Heirwegh (Mid & Small Caps) +32 2 565 87 60  
Klaas Kruijer (Banks) +31 20 527 91 44  
Geraldine O'Keeffe (Biotech) +31 20 527 91 50  
Teun Teeuwisse (Temporary Employment/Media) +31 20 527 13 01  
David Vagman (Holdings) +32 2 565 67 25  
René Verhoef (Mid & Small Caps) +31 20 527 91 45  
Steven Vlek (Real Estate) +31 20 527 23 28  
Robert Jan Vos (Food Producers/Food Retail) +31 20 527 91 47  
Miriam Wijnands (Real Estate) +31 20 527 23 23

### France

Philippe Ezechian (Head) +33 1 55 67 72 29  
Thomas Alzuyeta (Leisure & Services) +33 1 55 67 72 48  
Séverine Blé (Food) +33 1 55 67 72 41  
Claire Deray (Transport/Consumer Goods/Retail) +33 1 55 67 72 43  
Lazare Hounhouayenou (Media) +33 1 55 67 72 45  
Marc Huberty (Industrials) +33 1 55 67 72 30  
Bertrand Laport (IT Hardware) +33 1 55 67 72 31  
Olivier Macquet (Industrials & Services) +33 1 55 67 72 42

### Spain

Antonio López (Head/Utilities) +34 91 436 56 50  
Diego Barrón (Banks/Insurance) +34 91 436 56 29  
Fernando Cordero (Mid & Small Caps/Technology/Media) +34 91 436 56 16  
Luis Padrón (Telecom/Media) +34 91 436 56 07  
Rafael Rico, CFA (Oil/Basic Materials/Mid & Small Caps) +34 91 436 56 84  
Emilio Rotondo (Construction/Real Estate) +34 91 436 56 12  
Francisco Ruiz (Mid & Small Caps/Retail) +34 91 436 56 76  
Manuel Zayas (Mid & Small Caps) +34 91 436 55 41

### US

Patrick Moriarty, Ph.D. (Biotech) +1 212 340 54 97

## Retail Banking and Private Banking Research

Koen Van de Steene (Head/Healthcare) +32 2 565 86 14  
Laurent Bailly (Technology/Consumer Cyclical) +32 2 565 44 05  
Christel Bosch (Energy/Industrials/Utilities) +32 2 565 82 34  
Rudy De Groot (Financials) +32 2 312 03 43  
Geert Ruyschaert (Co-ordinator Top-Down/Telecom/Media) +32 2 565 19 58  
Alain Servais (Editor) +32 2 228 92 30  
Kristof Wauters (Fixed Income/Forex) +32 2 565 51 35

**Economic, Fixed Income, Forex & Money Markets Research**  
[www.merchantbanking.fortis.com/forpro](http://www.merchantbanking.fortis.com/forpro)  
Bloomberg: FMRS

**Equity Research**  
[www.merchantbanking.fortis.com/forpro](http://www.merchantbanking.fortis.com/forpro)  
Bloomberg: FINV

Please send an e-mail to [customer care.forpro@fortis.com](mailto:customer care.forpro@fortis.com) to request login/password for Bloomberg and/or website

**Fortis Bank SA/NV**

Montagne du Parc 3  
B-1000 Brussels  
Belgium  
Tel: +32 2 565 11 11

**Fortis Bank (Nederland) N.V.**

Rokin 55 (visiting address)  
P.O. Box 243  
1000 AE Amsterdam  
The Netherlands  
Tel: +31 20 527 91 11

**Fortis Bank Austria**

Euro Plaza/D  
Wienerbergstrasse 41  
1120 Vienna  
Austria  
Tel: +43 1 81 10 43 81 85

**Fortis Bank Czech Republic**

Myslbek Building  
Ovočný Trh 8  
117 19 Prague 1  
Czech Republic  
Tel: +420 225 43 60 10

**Fortis Bank Denmark**

Gothersgade 49 3.  
1123 Copenhagen  
Denmark  
Tel: +45 32 71 19 09

**Fortis Bank, Succursale en France**

30, quai de Dion Bouton  
F-92824 Puteaux Cedex  
France  
Tel: +33 1 55 67 72 00

**Fortis Bank Germany**

Christophstrasse 33-37  
50670 Cologne  
Germany  
Tel: +49 221 161 13 30

**Fortis Bank Greece**

Sygroú Ave 166  
17671 Athens  
Greece  
Tel: +30 21 09 54 43 70

**Fortis Bank Hong Kong**

27/F, Fortis Bank Tower  
77-79 Gloucester Road  
Hong Kong  
Tel: +852 28 23 04 56

**Fortis Bank Hungary**

Deak Ferenc 15  
1052 budapest  
Hungary  
Tel: +36 14 83 81 09

**Fortis Bank Italy**

Via Cornaggia 10  
I-20123 Milano  
Italy  
Tel: +39 02 57 53 24 61

**Fortis Banque Luxembourg**

50, avenue J.F. Kennedy  
L-2951 Luxembourg  
Luxembourg  
Tel: +352 42 421

**Fortis Bank Norway**

Haakon Vll's gate 10  
0161 Oslo  
Norway  
Tel: +47 23 11 49 50

**Fortis Bank Polska S.A.**

P.O. Box 15  
02-676 Warszawa  
Poland  
Tel: +48 22 566 90 00

**Fortis Bank Portugal**

Rua Alexandre Herculano 50-6 Andar  
1250-011 Lisboa  
Portugal  
Tel: +351 213 13 93 16

**Fortis Bank SA/NV, Singapore Branch**

63 Market Street #21-01  
Singapore 048942  
Tel: +65 65 38 03 90

**Fortis Bank S.A., Sucursal en España**

Serrano 73  
28006 Madrid  
Spain  
Tel: +34 91 436 56 00

**Fortis Bank Romania**

Tipografilor 11-15  
013714 Bucharest  
Romania  
Tel: +40 21 401 17 02

**Fortis Bank Sweden**

Birger Jarlsgatan 25  
10396 Stockholm  
Sweden  
Tel: +46 8 505 375 59

**Fortis Bank Switzerland**

Rennweg 57  
8021 Zurich  
Switzerland  
Tel: +41 58 322 09 70

**Fortis Bank Turkey**

Yıldız Posta Caddesi  
No: 54 Gayrettepe  
34353 Istanbul  
Turkey  
Tel: +90 212 274 42 80

**Fortis Bank SA/NV, UK Branch**

5 Aldermanbury Square  
EC2V 7HR London  
United Kingdom  
Tel: +44 20 32 96 80 00

**Fortis Bank USA**

520 Madison Avenue, 3rd Floor  
New York, NY 10022  
United States  
Tel: +1 212 418 87 00

**Fortis Securities LLC**

520 Madison Avenue, 3rd Floor  
New York, NY 10022  
United States  
Tel: +1 212 418 87 14

Each research analyst primarily responsible for the content of this research report certifies that with respect to each security or issuer that the analyst covered in this report: 1) all of the expressed views accurately reflect his or her personal views about those securities or issuers, and 2) no part of his or her compensation was, is, or will be, directly or indirectly, related to the specific recommendation or views contained in this report.

**Production of the document**

Fortis Bank SA/NV, with registered office at Montagne du Parc 3, 1000 Brussels, Belgium ("**Fortis**"), is responsible for the production and the dissemination of this document, which has been prepared by the individual(s) working for Fortis or any of its affiliates and whose respective identity is disclosed in this document (the "**persons involved**") (together the "**producers of the document**"). This document can be distributed (i) by an affiliate of Fortis Bank SA/NV that is not registered as a U.S. broker-dealer to major U.S. institutional investors only and (ii) by Fortis Securities LLC, a U.S. registered broker-dealer, to all U.S. persons.

**No public offer or financial promotion**

This document does not constitute an offer or solicitation for the sale, purchase or subscription of any financial instrument in any jurisdiction. It is not directed to, or intended for distribution to, any person or entity who is a citizen or resident of or incorporated or located in any jurisdiction where such distribution would be contrary to local law or regulation and/or where Fortis would infringe any registration or licensing requirement within such jurisdiction. This document has been provided to you for your personal use only and should not be communicated to any other person without the prior written consent of Fortis. Should you have received this document by mistake, please delete or destroy it, and notify the sender immediately.

**Sources and disclosure**

Fortis believes that the information and/or the interpretations, estimates and/or opinions regarding the financial instrument(s) and/or issuer(s) to which this document relates (respectively, the "**financial instrument(s) concerned**" and/or the "**issuer(s) concerned**") are based on reliable sources. Fortis makes no representations as to the accuracy or completeness of those sources and, in any case, the recipients of this document should not exclusively rely on it before making an investment decision. The interpretations, estimates and/or opinions reflect the judgement of Fortis on the date of this document and are subject to changes without notice. This document has not been disclosed to the issuer(s) concerned prior to its dissemination by Fortis.

**No investment advice**

The information contained herein does not constitute investment advice nor any other advice of whatever nature (including advice on the tax consequences that might result from making any particular investment decision). Investments in the financial instrument(s) to which this document relates may involve significant risks, are not necessarily available in all jurisdictions, may be illiquid and may not be suitable for all investors. The value of, or income from, any financial instrument(s) concerned may fluctuate and/or be affected by external factors such as exchange rates fluctuations. Past performance is not indicative of future results. This document is intended for general circulation and does not take into account the recipient's particular financial knowledge and experience, investment objectives and financial situation or needs, and is not intended as a personal recommendation to invest in the financial instrument(s) concerned. Before making an investment decision on the basis of this document, an investor should consider whether such investment is suitable in light of, amongst others, its particular financial knowledge and experience, investment objectives and financial situation and, if necessary, should seek appropriate professional advice. Neither Fortis nor any of its group companies (including any subsidiary, affiliate or holding company), directors, officers and employees shall in any way be liable or responsible (whether directly or indirectly) for any costs, claims, damages, liabilities and other expenses, including any consequential loss, arising from any use of this document, except in the event of wilful misconduct or gross negligence on their part.

**Supervision**

Fortis Bank SA/NV is authorised by and subject to the supervision of the "Commissie Bancaire, Financiële et des Assurances/Commissie voor het Bank-, Financien Assurantiewezen" (the "**CBFA**") in Belgium and each of its affiliates is regulated by the supervisory authority of the country in which it carries out its activities.

**Copyright**

This document contains information, text, images, logos, and/or other material that is protected by copyrights, database rights, trademarks, or other proprietary rights. It may not be reproduced, distributed, published or used in any way by any person for any purpose without the prior written consent of Fortis or in the case of third party materials, the owner of that content.

To check the occurrence of possible (conflicts of) interests please visit our website through the link:  
<http://www.fortisbusiness.com/fbweb/service/disclosures/companies.jsp>