The impact of forward sales on the price of gold*

by H.L. Monro

CONTRIBUTION BY J.R.F. HANDLEY†

Mr Monro is to be congratulated on his concise treatment of a very complex subject. As a graduate with only Mathematics I in my curriculum, I am unable to comment on the mathematical treatment of the factors affecting his supply/demand model, but the logic does not escape me. The main conclusion is that any excess of supply to the spot gold market will depress the price in a normal market, and particularly in a falling market.

One of the over-riding difficulties in an assessment of the gold market is the fact that the turnover on the spot market is never disclosed! Under these circumstances, all researchers are severely hamstrung, being denied the essential fundamental data of the market. From time to time, certain sales are admitted and, whenever these have been on a large scale, their effect on the total market can be determined.

> In March 1990, the Bank of Jedda sold between 60 and 90 tonnes of gold on the spot market. The gold price fell from $390 to $370 within the day. The $20 fall represents between 28 and 42 US cents for every additional tonne of gold sold (0,07 to 0,11 per cent of the ruling price). Some computer-triggered stop-loss sales resulted in additional unrecorded gold being sold so that the overload on the market was greater than disclosed.

> In May 1990, an Arabian bank was reputed to have dumped 60 tonnes of gold on the spot market. On this occasion, the price fell from $377 to $361, a fall of 27 US cents per additional tonne (0,07 per cent).

> At the Financial Mail Conference in October 1991, Dr Alfred Schneider (of the Swiss Bank Corporation) suggested that the market price of gold fell by a dollar for every excess 5 tonnes of gold sold on the spot market. This averages 20 US cents for every additional tonne sold. He must have had some basis on which to arrive at such a figure.

Monro has come up with a figure identical to that of Schneider, which seems more than a coincidence!

The 1992 paper is, of course, Monro's third contribution to this topic. In 1980 and 1984, he advocated the cessation of the mining of marginal gold ores since the gold so produced depressed the gold price and resulted in a lower price being obtained for the (much larger) tonnage of gold produced at a profit. In his 1984 paper, Monro suggested that the price sensitivity of gold, from the time it was demonitized to 1982, was R12 per additional kilogram when the price was R12 000 per kilogram or 0,1 per cent of the ruling price.

There seems to be a remarkable consistency in these numbers, and the gold production industry should take note that additional gold on the spot market does tend to depress the price. Monro's research and conclusions should be taken seriously, and the industry should be applying itself to correcting unnecessary imbalances and seeking ways of sensible marketing without causing the demise of a great industry.

In a contribution to Monro's paper, Lloyd‡ addresses the signs of the elasticities used by Monro. His arguments are valid since, in changing circumstances, the elasticities do change sign. Factors in the market such as net gold-bar purchases can, under certain circumstances, become net gold-bar sales. Lloyd's conclusion that forward sales can increase the price of gold has already been demonstrated under abnormal conditions. When the IMF and US Federal Reserve Bank sold gold in the 1978–1980 period, their actions were tantamount to forward sales in that they placed gold on the market that would not normally have been there. Their intentions were to depress the gold price (and make the dollar strong), but history shows that they misunderstood the market and the gold price rose to all-time highs. Their gold model failed to take public sentiment into account, and they failed in their objective as well as receiving a lower price for their gold than could have been obtained by another strategy—a rather expensive mistake guided by an imperfect model.

Lloyd also compares the forward selling of gold to forward selling in other commodity markets. Successful application in one should allow successful application in the other. This is not quite true because, in the gold market, there is a much greater shroud of mystery in that

> there is no stockpile of gold, all the gold offered being sold on a daily basis; the main market organizers are not normally participants but simply buy or sell for clients;

> there are no statistics available of the daily turnover on the world's gold spot markets (in contrast to the base-metal and platinum markets).

These two very fundamental differences place the gold spot markets in a category of their own. It is for these reasons, among others, that the gold price cannot be forecast with reliability. The problem is further complicated by man's, and woman's, 6000-year sentimental romance with the beauty of gold.

This does not mean that the South African gold-mining industry should plod along blindly. There is nothing more dangerous than careful forecasting (which is suddenly proved wrong) or blind acceptance of models that need annual adjustment. Scenario planning seems to be the answer for, by creating scenarios based on a very broad spectrum of facts and trying to interpret secular or personal sentiment, one can be a jump ahead of competitors.

The gold market needs to be addressed in the broadest sense, and the South African mining industry as a major contributor should constantly be studying and planning its strategy. Monro, in particular, must be congratulated on his constant and long-term plea for sales to be studied, but the problem is broader than that. We need a 'think tank' that will consistently examine the problems and out-perform the rest of the world's thinking on the strategies needed to control the gold market to our best advantage.

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REPLY BY H.L. MONRO

I thank Mr Handley for his perceptive contribution to my paper. Although he appears to agree with my views in general, it is clear that he is not happy with my use of fixed price elasticities, especially because of the enormous change in the price elasticity of gold demand in 1979 and 1980, when the price elasticity of gold bought as an investment obviously changed from a negative to a positive value.

This change was caused by the US Federal Reserve Bank neglecting to increase the discount rate sufficiently to ensure that US Government bonds still paid interest when inflation rose. The result was that interest on these bonds became negative, and a section of the US public, misinterpreting this to mean that the US Government was insolvent, rushed to buy gold. The resulting panic caused the price to rise further, and the price elasticity, normally –1, to rise to some positive value. The situation was rectified by the Federal Reserve Bank increasing interest rates until real rates became positive again. The price of gold then fell, and the price elasticity returned to its normal level of –1.

There is no model that will automatically allow for negligence. All one can do is to use the normal elasticity and hope for the best! Fortunately, mistakes of this magnitude are rare and unlikely to be repeated.

Prior to the collapse of the USSR, the price elasticity of the supply of gold from the Communist countries was –1, as derived in the paper. In 1990 it seems that the Soviet gold-mining industry also collapsed, and that every ounce of gold they had was sold. This implied a price elasticity of zero, as in the case of non-Communist countries.

A change in the price elasticity from –1 to zero had only a small effect, since the quantity of gold involved was relatively small. For the next few years, the price elasticity will have to be estimated annually until stability is achieved.

It is clear that occasional departures from the theoretical price elasticities must be expected. However, the normal estimates remain the best estimates of future values.

I can understand Handley's call for a 'think tank', because, although the mining industry is carrying out vital research in other aspects of mining, it is neglecting econometric research, which is relatively cheap and often very rewarding. However, I believe that econometric research would be best carried out by the mining houses individually.

Combating pipeline wear—an advancing technology*

by N.R. Steward and A.J.S. Spearing

CONTRIBUTION BY C.L. DE JONGH†

In the section 'Test Procedures', the authors mention the fact that the specimens (tailings) had to be changed every 5 minutes owing to the rapid degradation of the material.

The following suggestions are therefore made.

(1) Determine the difference between pipe wear with fresh tailings and that with degraded or rounded material.

(2) If the difference is significant, a system could possibly be developed for the sole purpose of changing the particle shape of the tailings. The desired changes could possibly be achieved by means of pipe loops made of wear-resistant material, or by means of a tumbler or tumblers.

However, certain disadvantages are obvious. These include a higher capital outlay and an increase in the amount of fines produced.

The advantages, on the other hand, could far outweigh the disadvantages. These are, for instance, an increase in pipe life and an improvement in drainage properties.

REPLY BY N.R. STEWARD

Mr de Jongh is most correct in his conclusions, but he reached them through incorrect interpretation of the paper. The specimens that were wearing in the jet of slurry

emitted from the end of the pipe loop were changed every 5 minutes, not the tailings. They were changed every 5 minutes because the size and sharpness of the particles in the slurry changed so rapidly with time. This short test exposure of wearing materials to a jet of slurry enabled the materials being worn to experience a slurry of similar particle characteristics.

Subsequently, it became possible to determine the effects of size and sharpness with reference to backfill tailings, which brings us to Mr de Jongh's conclusions.

It must be remembered that, in backfill applications, flowrates on gold mines approach 700 m³/h in the case of some dam-feed systems. The autogenous milling that resulted in the particle degradation described in the paper required the recirculation of 0,4 m³ of slurry for 3 hours. An industrial recirculation system would have to be considerable since any form of rapid degradation would result in the particles being broken into smaller sharp particles.

The effect on drainage and pipe life would be considerable. The pipe wear rates could decrease by up to 60 per cent. The drainage characteristics would probably improve but, in the case where intimate consolidation of the solids is necessary or beneficial such as in backfilling, angular particles lock better than round ones. Therefore, the main significance of Mr de Jongh's observation, with reference to backfilling, is one of wear and is correct. However, as he so correctly points out, the benefit of longer pipe lives has to be balanced against the capital outlay for a plant that does nothing other than recirculate slurry.

Institute of Quarrying—Surface Mining education *

Until recently, Surface Mining qualifications have not been recognized and have had to be produced 'in-house' through the larger mining houses.

The Institute of Quarrying has been instrumental in initiating syllabuses and courses, as well as helping to organize and fund the writing and presentation of the correspondence course.

An Education Trust Fund has been set up which is supported by the following industry leaders: Amcoal, Anglo American Corporation, Chamber of Mines, Consolidated Diamond Mines, Cullinan Minerals, Fortcrete, Gencor, Grinaker Construction, Hippo Quarries, Institute of Quarrying, Iscor, Johannesburg Consolidated Investments, Murray & Roberts Quarries, Osborn MMD, Palabora Mining Company, Pretoria Portland Cement, Rand Mines, Samancor, Stone & Allied Industries, and Vergenoeg Mining Company.

The funds from this Trust have been used to pay for the production of lecture notes at all levels. Wise investment will ensure continuous updating and revising.

The way has not been easy or troublefree; however, the courses are now organized as follows:

NI Surface Mining Course

This is a one-year correspondence course through Technisa with an entry requirement of Standard 7. The qualification gives a Standard 8 exemption and allows the candidate to sit for the Opencast Blasting Certificate.

1993 Examination dates Subjects	April	August	November
Surface Mining	05/04/93	02/08/93	22/11/93
Mathematics	02/04/93	30/07/93	19/11/93
Communications (Mining)	30/03/93	27/07/93	16/11/93
Engineering Science	07/04/93	03/08/93	23/11/93

N2 Surface Mining Supervisors Course

A one-year correspondence course through Technisa with an entry requirement of Standard 8 or Nl Surface Mining.

1993 Examination dates Subjects	April	August	November
Surface Mining	–	04/08/93	19/11/93
Surface Mine Economics	–	30/07/93	25/11/93
Mathematics	05/04/93	02/08/93	22/11/93
Communications (Mining)	–	03/08/93	23/11/93

N3 Surface Mining Supervisors Course

This course is currently under revision and update but is expected to be ready for release within the first semester of 1993.

This is a one-year correspondence course with an entry requirement of Matric or N2 Surface Mining Supervisors Course. Completion of this course qualifies the candidate for employment at Senior Supervisor level at any Surface Mining operation and provides qualification for entry into the Surface Mining Diploma.

1993 Examination dates Original subjects	April	August	November
Opencast Mining	01/04/93	26/07/93	–
Opencast Machinery	07/04/93	03/08/93	–
Mine Surveying	03/04/93	05/08/93	–
Mining Geology	30/03/93	27/07/93	–

Enquiries for all N-level courses can be made to Mr Wally Forrester, Technisa, Private Bag X7, Pinegowrie 2123. Telephone: (011) 886-1531; Fax: (011) 886-7718.

The SA College of Mining offers block-release courses from Nl to N3 level providing there are sufficient numbers to run the course. Contact can be made with Mr B. van Rensburg, SA College of Mining, P.O. Box 1001, Roodepoort 1725. Telephone: (011) 412-3468.

National Diploma: Surface Mining

This is a three-year correspondence course with an entry requirement of Senior Certificate with Mathematics or N3 Surface Mining Supervisors Course. Completion of this diploma will qualify the candidate to manage any Surface Mine in South Africa and provides the qualification for Member status in the Institute of Quarrying.

There is a compulsory practical programme in order to integrate theory and practice.

The course is run by Technikon RSA; registration is in January and examinations in November.

M1 (1st year)

Mathematics	Mine Engineering Science
Plant Fundamentals	Occupational Communication
Surface Mining I	Mine Management & Accounting I

M2 (2nd year)

Mine Engineering	Surface Surveying I
Surface Mining Plant II	Surface Mining II
Mine Management & Accounting II	

M3 (3rd year)

Surface Mining Geology I	Surface Surveying II
Surface Mining Plant III	Surface Mining III
Mine Management & Accounting III	

A fourth-year National Higher Diploma is being planned in correspondence format but is not available at this stage.

Enquiries for M-level (Diploma) courses may be made to Mr Jan Jonker, Technikon RSA, Private Bag X6, Florida 1710. Telephone: (011) 471-2354; Fax: (011) 471-2134.

NHDF Surface Mine Management

From the beginning of 1993, the Mining Department of the School of Mines Technikon Witwatersrand will present a full-time National Higher Diploma.

The course is primarily designed to cater for past students of the National Diplomas for Coal and Metalliferous Mining, who have transferred their interests from underground to surface mining.

Graduates in Mining Engineering or other engineering disciplines, as well as those industry candidates who have already obtained a Mine Manager's certificate, are invited to apply for entrance to this qualification.

The course content incorporates the 'applied academic approach' to all aspects applicable to the management of a surface-mining operation.

Subjects

Mineral Engineering Management, Surface Mining Plant, Surface Mining Surface Mine Planning, Legal Knowledge

The NHD course will consist of 12 months of study, one semester (4,5 months) of which is to be full-time study at Technikon Witwatersrand. The remainder will be 'Experiential Training', in which the student will be required to carry out certain minimum practical requirements applicable to each of the subjects mentioned above. These requirements could be carried out without disrupting the normal duties at a surface mine.

Enquiries for Higher National Diploma—Surface Mine Management may be made to Mr Peter Knottenbelt, Technikon Witwatersrand, P.O. Box 3293, Johannesburg 2000. Telephone: (011) 406-2338; Fax: (011) 402-0475.

Enquiries relating to the Institute of Quarrying can be directed to Mrs Lynne Montgomery, Institute of Quarrying, P.O. Box 940, Walkerville 1876. Telephone: (011) 949-1608; Fax: (011) 949-1534.

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