

File- Monetary Policy Issues-Exchange Rate  
Intervention – Part E

Reference MG-MAMC/D/0002/001

File begins 03/05/1988

Pages 20-38

FROM: H C GOODMAN

DATE: 18 May 1988

20

MISS O'MARA

cc Mr Peretz  
Mr Grice 89/a.  
Mr Ilett  
Mr Batt  
Mr Courtney  
Mr Savage  
Mr Conaty  
Mr Nelson

GOLD

I attach a re-draft of the Bank's paper taking account of your comments and those of MG2, IF and FIM. I am particularly grateful to Mr Conaty for Annex A.

2. Taking account of MG2's points on diversification, the arguments for holding gold as an investment appear even weaker than in the Bank's draft. However, I should say that Michael Foot is critical of the MG2 position on the grounds that the data used does not go back far enough and does not cover the war period, or any other "major crisis". This criticism seems to me, however, to rely implicitly on the "war chest" argument.

3. I have reinstated paragraphs 12 and 13 from the 1986 Courtney/Ilett paper. You may wish to include 12, but not 13, in the light of work on EMS reform since that paper was written.

4. You will see that taking account of all these comments the emphasis of the arguments for holding gold shift slightly, away from war chest/investment and towards institutional.

933/88

H C Goodman.  
H C GOODMAN

14/62

## THE EXCHANGE EQUALISATION ACCOUNT'S HOLDINGS OF GOLD

1. The EEA's holdings of gold, including the gold swapped for ECU's with the EMCF, amounts to 23.8 mn ozs, or some 740 tons. Since the substantial reduction in stocks in the late 1960's and early 1970's resulting from the then balance of payments' crises, there has been no significant change in holdings. At the annual revaluation of the reserves in March 1988, the gold holdings were worth \$8.1 bn. However as a share of total reserves they have fallen significantly from 31 per cent in 1980 to 17 per cent of total spot reserves now. Table 1 shows the change.

2. Table 2 compares UK official gold holdings since 1969 with those of other industrialised countries and, with Chart 1, shows that, Japan apart, UK holdings are low both in absolute terms and as a proportion of total reserves. As with the UK, there has been little movement in the level of gold holdings by most other countries in recent years.

3. There are three principal reasons why countries wish to retain an element of gold in their reserves:

(a) as the ultimate store of value, the "war chest" argument;

(b) as an alternative investment to holdings of currencies and other reserve assets;

(c) as an insurance against gold resuming a central role in the international monetary system.

(a) The "war chest" argument

4. For thousands of years gold has been, in times of war and crisis, the ultimate store of value and medium of exchange. Gold is virtually indestructible, anonymous, mobile and almost universally acceptable. In times of crisis and uncertainty the presence of a sizeable gold holding boosts confidence of creditors,

Not least because gold is the highest quality asset: unlike foreign currencies, it is not a claim on a debtor (bank or government) and therefore does not have the same risk of default in times of crisis. The war chest argument is still a cogent one but it does not, of course, tell you what size of gold holdings are necessary insurance against catastrophe.

(b) Gold as an investment

5. The return on gold is measured by the increase in its value over time. This can be compared with the return on alternative financial assets over the same period. Table 3 compares the return on our gold holdings to the return we would have used from holding US Treasury Bills. However, even more than with other financial assets, the profitability of holding gold depends critically upon the time period examined: purchases before 1980 would have been a good investment, purchases subsequently a poor investment because the price peaked in 1980, and since, real interest rates have been positive and global inflation receding.

6. Table 4 gives average annual rates of return over various time periods when in each case the closing date is 1987 when the average gold price was \$487. It uses various starting dates. Those to which greatest weight should be given are probably 1973, since that was the beginning of the period when there was a free market for gold (the unofficial price had been free since 1968, but was probably still constrained by the fixed official price until the period of floating exchange rates began); and 1914, since that was the end of the pre-war period when there were no significant restrictions on gold-holding or prices (of course the nominal price of gold was fixed in most currencies, but since under the gold standard the price level was influenced by the supply of and demand for gold, one can argue that the real price of gold was not constrained in the long term). For any starting date between 1914 and 1973 the return on gold measured to any date after 1973 is shifted upwards by the effect of the freeing of gold from the fixed nominal official price of \$20.67 per ounce until 1934 and \$35 per ounce until 1971.

6'

7. There is a case for extending the starting date backwards to 1879 (when the US adopted the gold standard), but this would include the period of the South African gold discoveries, a geological discovery which is unlikely to be duplicated. Moreover, since the return on gold is being compared to the return on US financial instruments, it may be appropriate to omit the period before 1914, when the US, as a developing, capital-importing country had real interest rates generally above those in London, in contradistinction to the period after the first World War.

8. Of course, it should also be noted that the past is not necessarily a good guide to the future.

9. In addition to measuring the average return over different period, it is also important to consider the extent to which the return from gold has fluctuated differently from the return on other assets. Since that may reduce the overall risk of our reserves portfolio if its rate of return is not perfectly correlated with that on the other assets in the portfolio. Whether gold serves such a purpose depends both upon:

(i) how great the variability of its return is relative to that on alternative assets;

(ii) how much less than perfectly correlated is its rate of return with that on other assets.

In fact the answer will depend upon the accounting currency that we are interested in. Assets which reduce risk valued in one currency may not do so when valued in a different currency or basket of currencies.

10. Nevertheless, Annex A shows that over the past 20 years either in dollars or SDR terms, gold has had little or no role to play in reducing risk. Its lack of correlation in return with that on other assets has not been sufficient to outweigh its own relatively high variability of return. The conclusion must be, therefore, that the decision to continue holding significant levels of gold in our reserves must be on other grounds.

(c) Gold in the international monetary system

11. After the collapse of the Bretton Woods system and the abolition of the fixed parities between domestic currencies and gold, the international monetary community decided in principle to remove gold from the international monetary system. Until late 1978 central banks understood not to add to their gold stocks, and the IMF and the USA reduced their gold holdings through auction.

12. However, the move to eliminate gold never gathered much momentum, and has now petered out. The European Monetary System (EMS) has given gold something of a new role in international monetary affairs. Gold deposited with the EMCF can be used to obtain currency through the ECU mobilisation process or (were we in the exchange rate mechanism (ERM) through the use of official ECUs themselves). However, EMS membership (or for that matter, ERM participation) does not constitute an overwhelming ground for maintaining present gold holdings, though ECU mobilisation, within limits, makes gold deposited with the EMCF more liquid.

13. [The mechanism for creating ECUs through the EMCF works on both gold and dollar deposits, so that to the extent that gold was replaced by dollars, the EMCF's capacity to create ECUs would not be affected. Furthermore, the logic of the system is that an identifiable Community asset is created against the deposit of non-Community reserve assets, namely dollars and gold. There is no reason in logic why EMCF members should not deposit 20 per cent of their reserves in non-Community currencies other than dollars as well, eg. Yen and Swiss Francs, if it is desirable to increase the scale of ECU creation or to compensate for reductions in gold deposits.]

14. Looking forward over the longer term, it is possible that if moves towards more managed rates continue, there will be renewed attempts to restore gold to a more formal role as a reserve asset. It was interesting to note the amount of speculation along these lines in the US last Autumn, following Secretary Baker's proposal for a commodity indicator (including gold), even though Secretary Baker was at pains to make it clear that he was not

Advocating a commodity standard. However, the probability of this happening is not sufficiently high to justify the UK retaining its gold stocks on these grounds alone.

15. Gold is therefore left with something more than a residual function. Its possession is likely to increase confidence in the holder's currency, at least in times of difficulty; and although it is illiquid compared to many financial assets, and expensive to store, in most circumstances it can be used as security for borrowing or to obtain currency through swaps.

#### The outlook for the gold price

16. Demand and supply in gold are always difficult to measure because of the special nature of the metal. Unlike other commodities, demand for gold does not for the most part lead to "consumption" of the metal; while it may be transmuted into another form it remains as a potential overhang on the market as it can in the right circumstances, such as the price surge in 1980, be re-sold. In addition, the amount of gold coming on to the free market from the communist world in particular is not known, although some estimates are available. Making due allowance for all this, Table 5 attempts to show how supplies of metal coming on to the market in 1985 and 1986 (a period which saw relatively little change in the dollar price) have been absorbed.

17. New gold production has been rising rapidly in recent years. Although production in the main supplier, South Africa, which provides about 50 per cent of total output, has been static, elsewhere it has soared. New technology and the profitability of gold-mining (production costs of \$250 per fine ounce against a market price of \$439 per fine ounce) have meant that enormous resources have been devoted to the search for gold. Output in Australasia, the USA and Canada in particular has grown rapidly and is expected to continue to do so over the next few years. From 1280 tons in 1986, non-communist output is forecast to rise to 1500 tons in 1990.



18. It is difficult to see where the demand for gold on this scale at the present level of price is going to come from. Investment demand does not seem likely to pick up while global inflation remains low and real interest rates remain positive. The increased production in 1986 was only absorbed with little impact on the price by the purchase of some \$600 million worth of gold (about 60 tons) by Japan for the Hirohito coin. Without similar large scale purchases from some source in each of the next few years, pressure on the price must be likely. After 1990, however, increases in supply would, on present forecasts, appear to tail off, while industrial demand in the strong-currency countries, especially Japan, is likely to have increased. In summary, while it is difficult because of supply considerations to be optimistic about the course of gold price over the next few years, thereafter supply and demand may come into better balance.

#### The transparency of operations in gold

19. The level of the major countries' gold holdings is readily available, being published each month with a short time lag in IFS, and is potentially the focus of considerable media interest. As stated in paragraph 2 and demonstrated in Table 2, the level of G7 countries' holdings has altered hardly at all in recent years and the sale or purchase of gold on anything other than a small scale would rapidly become public and would carry considerable implications for the price. Any move to reduce our present holding would therefore require careful handling if market disruption was to be avoided. Given the present relatively high level of currency reserves, it would be difficult to claim that sales were being made from necessity and thus it would be clear that the action represented a judgement on the future level of the gold price. While this might prove correct in the short-term, it might not do so over a longer period with consequent undesirable publicity. The international consequences also might be unsatisfactory as such action by the UK might have the effect of reopening the debate about the future of gold and freeing other G7 countries from the self-imposed restraint they clearly feel in relation to their holdings.



20. Given the present state of demand and supply mentioned above, any move to increase our present holdings might not have too much impact on the market as a whole. It would, however, run the risk of proving to be an unwise investment and give, on the one hand, comfort to South Africa and the Soviet Union but on the other, as a comment upon the dollar, possibly great offence to the US.

#### Earnings on gold

21. There are ways in which the EEA can realise a small return on gold, without changing significantly the overall level of stocks, which we do already exploit. Despite the launch of the Britannia the Bank continues to see a small but steady demand for the half sovereign and, to a much smaller degree, the sovereign. These coins are sold at a premium (15 per cent in the case of the half sovereign, 2½ per cent for the sovereign) over their gold content giving rise to modest but useful profits to the EEA. Secondly, within agreed limits, the Bank has also increased its gold lending operations leading to earnings of some £½ million from these activities over the last two years. There may be scope for some further modest increase in this business in the future which will be discussed between the Bank and HMT.

#### Conclusions

22. (a) the UK's gold holdings are modest both absolutely and proportionately, as compared with other G7 countries and in relation to the recent past;

(b) gold still has a role as a strategic store of value; as an investment its relative performance depends greatly upon the period over which that performance is measured. It has a small role in our portfolio by helping to diversify risk;

(c) gold holdings also form part of our contribution to the EMCF swap;

(d) demand and supply considerations make us bearish about the price prospects in the short-term although not necessarily in the medium term but in practice there are significant international constraints on our scope for manoeuvre.

#### Recommendations

23. (a) the EEA's gold holdings should be retained for the time being, at approximately their present level;

(b) consistent with prudential considerations, we should seek to exploit whatever opportunities there are for earning a return on our gold holdings;

(c) these recommendations should be reviewed at official level if the price of gold moves (up or down) by, say, \$100 an ounce from its present level and in the light of developments in the operation of the EMS.

GOLD HOLDINGS AS A PERCENTAGE OF PUBLISHED SPOT RESERVES --- 1970-1988

| END-PERIOD | LEVEL OF GOLD<br>HOLDINGS | LEVEL OF PUBLISHED<br>SPOT RESERVES | \$ MILLION<br>GOLD AS % OF<br>PUBLISHED SPOT RESERVES |
|------------|---------------------------|-------------------------------------|-------------------------------------------------------|
|            |                           |                                     |                                                       |
| 1970       | 1348                      | 2827                                | 48                                                    |
| 1971       | 843                       | 6582                                | 13                                                    |
| 1972       | 801                       | 5646                                | 14                                                    |
| 1973       | 887                       | 6476                                | 14                                                    |
| 1974       | 888                       | 6789                                | 13                                                    |
| 1975       | 888                       | 5429                                | 16                                                    |
| 1976       | 888                       | 4129                                | 21.5                                                  |
| 1977       | 938                       | 20557                               | 4.5                                                   |
| 1978       | 964                       | 15694                               | 6                                                     |
| 1979       | 4075                      | 22538                               | 18                                                    |
| 1980       | 8724                      | 27476                               | 32                                                    |
| 1981       | 9160                      | 23347                               | 39                                                    |
| 1982       | 5703                      | 16997                               | 33.5                                                  |
| 1983       | 7392                      | 17817                               | 41.5                                                  |
| 1984       | 6845                      | 15694                               | 44                                                    |
| 1985       | 5387                      | 15543                               | 35                                                    |
| 1986       | 6121                      | 21923                               | 28                                                    |
| 1987       | 7240                      | 44326                               | 16                                                    |
| 1988+      | 8086                      | 47519                               | 17                                                    |

NOTES

Figures extracted from Bank of England Quarterly Bulletins. Figures prior to 1970 published in sterling terms therefore not compatible with above figures.

+ Post Revaluation.

TABLE 1

VOLUME (mns ozs) OF OFFICIAL GOLD RESERVES IN VARIOUS COUNTRIES (1968-OCTOBER 1987)

| DATE<br>(end<br>years) | Belgium<br>and<br>Luxembourg | Denmark | France | West<br>Germany | Holland | Ireland | Italy | Japan | Switzer-<br>land | UK   |
|------------------------|------------------------------|---------|--------|-----------------|---------|---------|-------|-------|------------------|------|
| 1968                   | 43.5                         | 3.3     | 110.8  | 129.7           | 48.5    | 2.3     | 83.5  | 10.2  | 75.0             | 42.1 |
| 1969                   | 43.4                         | 2.5     | 101.3  | 116.6           | 49.2    | 1.1     | 84.5  | 11.8  | 75.5             | 42.1 |
| 1970                   | 42.0                         | 1.8     | 100.9  | 113.7           | 51.1    | 0.5     | 82.5  | 15.2  | 78.0             | 38.5 |
| 1971                   | 44.1                         | 1.8     | 100.7  | 116.5           | 54.5    | 0.5     | 82.4  | 19.4  | 83.1             | 22.2 |
| 1972                   | 43.1                         | 1.8     | 100.7  | 117.4           | 54.2    | 0.5     | 82.4  | 21.1  | 83.1             | 21.1 |
| 1973                   | 42.2                         | 1.8     | 100.9  | 117.6           | 54.3    | 0.4     | 82.5  | 21.1  | 83.2             | 21.0 |
| 1974                   | 42.2                         | 1.8     | 100.9  | 117.6           | 54.3    | 0.5     | 82.5  | 21.1  | 83.2             | 21.0 |
| 1975                   | 42.2                         | 1.8     | 100.9  | 117.6           | 54.3    | 0.5     | 82.5  | 21.1  | 83.2             | 21.0 |
| 1976                   | 42.2                         | 1.8     | 101.0  | 117.6           | 54.3    | 0.5     | 82.5  | 21.1  | 83.3             | 21.0 |
| 1977                   | 42.5                         | 1.9     | 101.7  | 118.3           | 54.6    | 0.5     | 82.9  | 21.6  | 83.3             | 22.2 |
| 1978                   | 42.6                         | 2.0     | 102.0  | 118.6           | 54.8    | 0.5     | 83.1  | 24.0  | 83.3             | 22.8 |
| 1979                   | 42.8                         | 2.1     | 102.4  | 119.1           | 55.0    | 0.5     | 83.4  | 24.2  | 83.3             | 22.8 |
| 1980                   | 42.7                         | 2.0     | 102.3  | 119.0           | 54.9    | 0.5     | 83.3  | 24.2  | 83.3             | 23.6 |
| 1981                   | 42.7                         | 2.0     | 102.3  | 119.0           | 54.9    | 0.5     | 83.3  | 24.2  | 83.3             | 23.8 |
| 1982                   | 42.7                         | 2.0     | 102.3  | 119.0           | 54.9    | 0.5     | 83.3  | 24.2  | 83.3             | 23.8 |
| 1983                   | 42.7                         | 2.0     | 102.3  | 119.0           | 54.9    | 0.5     | 83.3  | 24.2  | 83.3             | 23.8 |
| 1984                   | 42.7                         | 2.0     | 102.3  | 119.0           | 54.9    | 0.5     | 83.3  | 24.2  | 83.3             | 23.8 |
| 1985                   | 42.7                         | 2.0     | 102.3  | 119.0           | 54.9    | 0.5     | 83.3  | 24.2  | 83.3             | 23.8 |
| 1986                   | 42.7                         | 2.0     | 102.3  | 119.0           | 54.9    | 0.4     | 83.3  | 24.2  | 83.3             | 23.8 |
| 1987 (end<br>Oct)      | 42.3                         | 2.0     | 102.3  | 119.0           | 54.9    | 0.4     | 83.3  | 24.2  | 83.3             | 23.8 |

Note: EMS countries' holdings include the 20 per cent of gold reserves swapped against ECUs with the EMCF

# GOLD AS A PROPORTION OF TOTAL RESERVES

(as at end-September 1987)

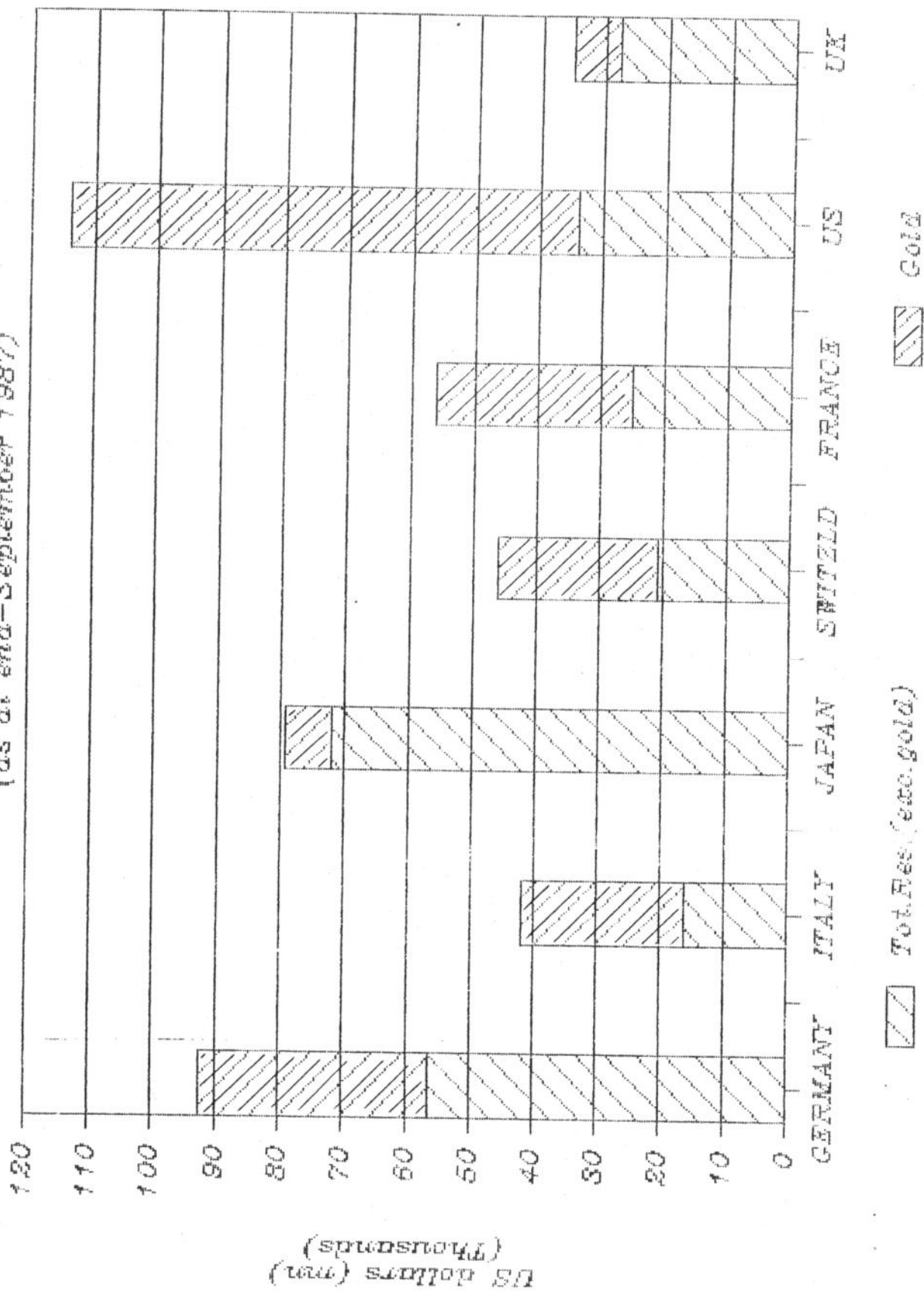


TABLE 3

## OFFICIAL UK GOLD HOLDINGS: VOLUMES AND RATES OF RETURN (1968-87)

| (1)<br>Official gold reserves<br>(mns of fn ozs)<br>end-period | (2)   | TOTAL excl<br>EMCF swap | London<br>Gold price<br>(\$/fine<br>ounce; end<br>period | Gold (3) | Nominal return<br>(£, % pa)* on<br>holdings of | (5)<br>£ return<br>from holding<br>gold rather<br>than US TBs<br>[(3)-(4)] |
|----------------------------------------------------------------|-------|-------------------------|----------------------------------------------------------|----------|------------------------------------------------|----------------------------------------------------------------------------|
|                                                                |       |                         |                                                          |          |                                                |                                                                            |
| Total                                                          |       |                         |                                                          |          | US Treasury<br>Bills (4)                       |                                                                            |
| 1968                                                           | 42.09 | -                       | 41.9                                                     | -        | -                                              | -                                                                          |
| 1969                                                           | 42.05 | -                       | 35.2                                                     | -        | + 6.1                                          | - 22.7                                                                     |
| 1970                                                           | 38.52 | -                       | 37.4                                                     | + 6.6    | + 6.9                                          | - 0.4                                                                      |
| 1971                                                           | 22.18 | -                       | 43.6                                                     | + 9.4    | - 2.1                                          | + 11.4                                                                     |
| 1972                                                           | 21.08 | -                       | 64.9                                                     | + 61.8   | +13.5                                          | + 48.3                                                                     |
| 1973                                                           | 21.01 | -                       | 112.3                                                    | + 74.9   | + 8.4                                          | + 66.5                                                                     |
| 1974                                                           | 21.03 | -                       | 186.5                                                    | + 64.3   | + 7.0                                          | + 57.3                                                                     |
| 1975                                                           | 21.03 | -                       | 140.3                                                    | - 12.7   | +23.0                                          | - 35.7                                                                     |
| 1976                                                           | 21.03 | -                       | 134.8                                                    | + 14.2   | +59.1                                          | - 44.9                                                                     |
| 1977                                                           | 22.23 | -                       | 165.0                                                    | + 9.3    | - 5.9                                          | + 15.2                                                                     |
| 1978                                                           | 22.83 | -                       | 226.0                                                    | + 28.3   | + 0.6                                          | + 27.7                                                                     |
| 1979                                                           | 22.81 | 18.25                   | 512.0                                                    | +107.2   | + 1.0                                          | +106.2                                                                     |
| 1980                                                           | 23.55 | 18.84                   | 589.5                                                    | + 7.4    | + 4.6                                          | + 2.8                                                                      |
| 1981                                                           | 23.79 | 19.03                   | 397.5                                                    | - 15.7   | +43.6                                          | - 59.3                                                                     |
| 1982                                                           | 23.76 | 19.01                   | 456.9                                                    | + 35.8   | +31.4                                          | + 4.5                                                                      |
| 1983                                                           | 23.77 | 19.01                   | 381.5                                                    | - 7.1    | +21.1                                          | - 28.3                                                                     |
| 1984                                                           | 23.79 | 19.03                   | 308.3                                                    | + 1.4    | +38.0                                          | - 36.7                                                                     |
| 1985                                                           | 23.79 | 19.03                   | 327.0                                                    | - 15.1   | -14.0                                          | - 1.1                                                                      |
| 1986                                                           | 23.76 | 19.01                   | 390.9                                                    | + 17.1   | + 4.9                                          | + 12.2                                                                     |
| 1987                                                           | 23.76 | 19.01                   | 486.5                                                    | - 2.5    | -17.1                                          | + 14.6                                                                     |

\*calculated on the increase in the £ value of notional investments in gold and US Treasury Bills between successive end-years.

TABLE 4Average Annual Real Return to 1987, per cent

| from | <u>Gold</u> | <u>US Commercial Paper</u> | <u>6 month Treasury Bills</u> |
|------|-------------|----------------------------|-------------------------------|
| 1879 | 0.34        | 1.85                       | 1.24                          |
| 1914 | 0.75        | 0.71                       | 0.10                          |
| 1934 | 1.42        | -0.16                      | -0.77                         |
| 1935 | 0.45        | -0.05                      | -0.67                         |
| 1945 | 1.73        | 1.00                       | 0.38                          |
| 1969 | 6.83        | 2.02                       | 1.41                          |
| 1973 | 4.07        | 2.35                       | 1.74                          |

Source of Commercial paper rates and GDP deflator: Friedman & Schwartz, Monetary History of the US.



TABLE 5

GOLD SUPPLY AND DEMAND IN THE NON-COMMUNIST WORLD

|                                                                   |             | tons        |
|-------------------------------------------------------------------|-------------|-------------|
|                                                                   | <u>1985</u> | <u>1986</u> |
| Mine production                                                   | 1233        | 1281        |
| Net communist sales                                               | 210         | 402         |
| Net official sales (purchases)                                    | (135)       | (181)       |
| Scrap                                                             | <u>299</u>  | <u>465</u>  |
| Total supply                                                      | 1607        | 1967        |
| Fabrication demand                                                | 1467        | 1666        |
| Net surplus of supply over<br>fabrication (ie implied investment) | <u>140</u>  | <u>301</u>  |

Source: Gold 1987

The risk involved in holding an asset can be measured by the variability (measured in standard deviations) of its rate of return. As the table below shows the variability of the return on gold is significantly larger than that on dollar, yen and Deutschmark assets.

#### STANDARD DEVIATIONS OF RATES OF RETURN (DOLLAR VALUATION)

|              | 1968Q2-1987Q4 | 1972Q2-1987Q4 | 1982Q4-1987Q4 |
|--------------|---------------|---------------|---------------|
| Dollar Asset | .6            | .7            | .7            |
| DM Asset     | 5.9           | 6.4           | 6.0           |
| Yen Asset    | -             | 7.1           | 7.1           |
| Gold         | 14.2          | 13.0          | 16.3          |

- the dollar, DM and Yen assets, are bank deposits paying the 3 month interbank rate. All assets are valued in dollars. Rates of return are calculated quarterly and expressed as percentages.

As intervention is not aimed exclusively at influencing the dollar/sterling exchange rate, nor do we trade solely with the US, an SDR valuation is probably more appropriate for calculating the variability of rates of return. The following table shows the variability of SDR rates of return, it can be seen that the above conclusion still holds.

#### STANDARD DEVIATION OF RATES OF RETURN (SDR VALUATION)

|              | 1968Q2-1987Q4 | 1972Q2-1987Q4 | 1982Q4-1987Q4 |
|--------------|---------------|---------------|---------------|
| Dollar Asset | 3.0           | 3.7           | 3.5           |
| DM Asset     | 3.9           | 3.3           | 3.5           |
| Yen Asset    | -             | 4.7           | 4.0           |
| Gold         | 13            | 11.6          | 6.7           |

The variability of the rate of return on a portfolio of assets is not simply the sum of standard deviations of the component assets. This is because the movements in one direction in the

return on one asset may be offset by movements in the opposite direction by the return on another asset. Therefore although the return on the two assets may move about a lot, they may tend to cancel each other out so that the overall return on the portfolio is fairly stable. Therefore when considering how to reduce the variability of the return on a portfolio of assets, the degree to which the return on individual assets tend to move in opposite directions is very important. This can be measured by the correlation coefficient between two assets. If this is equal to one, it means the returns always move together, ie when one goes up, so does the other and vice-versa. If it equals minus one, it implies that the rates of return on the two assets always moves in opposite directions. Therefore if a portfolio contains two assets and the objective is to minimise risk, the closer the correlation coefficient is to minus one the better.

The largest single group of assets in the reserves are those denominated in dollars. So when deciding which other assets to include to reduce risk, it is the correlation coefficients between those assets and the dollar that are important.

#### CORRELATION BETWEEN DOLLAR AND NON-DOLLAR ASSETS

| DATE       | 1968Q2-1987Q4 |        | 1977Q2-1987Q4 |        | 1982Q4-1987Q4 |        |
|------------|---------------|--------|---------------|--------|---------------|--------|
| Valuation: | SDR           | Dollar | SDR           | Dollar | SDR           | Dollar |
| DM Asset   | - 43          | - 24   | - 77          | - 35   | - 82          | - 23   |
| Yen Asset  | -             | -      | - 47          | - 35   | - 62          | - 27   |
| Gold       | - 23          | - 12   | - 25          | - 12   | - 19          | - 16   |

- the figures given are the correlation coefficient (%) between the dollar asset and the asset shown in the left hand column. The first figure for each period is based on an SDR valuation the second on a dollar valuation.

It can be seen from the table that gold is less negatively correlated with dollar assets than either Deutschmark or yen assets. Hence diversification into gold is the least effective way to reduce risk.

51  
FROM: I POLIN  
DATE: 24 May 1988

MR PERETZ )  
MR BUSH ) COPY TO EACH

cc Miss O'Mara  
Ms Ryding  
Mr Wheatley  
Mr Nelson  
  
Mr Foot )  
Mr Reid )  
Mr Bailey ) Bank  
Mrs Jupp )

OK  
A

### RESERVES IN MAY 1988

I attach the draft press notice and briefing for the Reserves announcement on Thursday 2 June.

2. I have attempted to amend the press briefing to take account of recent events. However, I have tried to keep the number of questions down to a minimum.

3. My intention, as agreed by Miss O'Mara, is to come to the office on Tuesday 31 May solely to work on the Reserves, as the submission and final version of the briefing must be submitted on Wednesday 1 June. Therefore I must ask for any comments and/or amendments on the attached draft by at the very latest, lunchtime on Friday 27 May. This will enable me to discuss the draft with Miss O'Mara on Friday afternoon so as I can work on the final version on Tuesday.

*Ian Polin*  
I POLIN

FROM: I POLIN  
DATE: 1 June 1988

1. MISS O'MARA
2. ECONOMIC SECRETARY

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THE RESERVES IN MAY 1988

The reserves announcement for May will be made on Thursday 2 June at 11.30 am. This month's announcement reports a rise in the reserves of           million and an underlying rise of           million.

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