

International Gold Price Movements, 1972-1982

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This paper studies gold price movements during the decade 1972-82 which witnessed large fluctuations in gold price. Gold price traced out two principal cycles during the decade — moving up from 1971 it reached a peak in December 1974, then fell till the third quarter of 1976, rose again till early 1980, after which it fell up to June 1982.

Several developments in world economy could have influenced these movements in gold prices. The authors' study has, however, led them to conclude that the gold price cycles in the last decade were generated principally by speculative behaviour which, in turn, was influenced by cyclical forces in the world economic system. Specifically, the impact of three factors — inflationary expectations, exchange rate fluctuations and changes in interest rates — possibly influencing speculation in gold is discussed.

DURING the last decade, gold price has shown proneness to large and rapid fluctuations. Gold price has changed at particularly spectacular speeds in the latter half of the decade. The dollar price of gold increased more than eight times from a low of about \$ 100 an ounce in the summer of 1976 to a high of \$ 850 in January 1980. In the following eighteen months ending in June 1982, the price declined to less than \$ 300 an ounce, i.e., to almost one-third of the peak reached in January 1980. Recently, between July and September 1982, gold price underwent a mini-cycle, first rising from \$ 300 to \$ 500 an ounce and then declining to \$ 400.

It will be recalled that between 1934 and 1968 gold price was maintained at \$35 an ounce by the efforts of national monetary authorities.¹ Official attempts at controlling the market price of gold were, however, abandoned in March 1968. The two-tier gold pricing system then came into being: transactions in gold between national monetary authorities continued to be underwritten by the USA at \$ 35 an ounce; on the private market, gold price was left to find its own level. In August 1971, the two-tier system was also abandoned. The United States refused to convert even official holdings of dollar into gold at \$ 35 an ounce. The official gold price ceased to exist (except for some accounting purposes), and though national monetary authorities have continued to buy and sell gold, no attempt has been made by them to keep the free market price of gold within well-defined limits.

In this paper, we focus on gold

price movements during the decade 1972-1982, i.e., the period after the abandoning of the two-tier price system in August 1971. The decade, we have indicated, witnessed large fluctuations in gold price. The fluctuations were, however, not random. Gold price traced out two principal cycles during the decade. Moving up from 1971, it reached a peak in December 1974, then fell till the third quarter of 1976, rose again till early 1980, after which it fell up to June 1982. Though we shall be concerned primarily with these two cycles, we shall also indicate how the recent mini-cycle between June and September 1982 could be explained in terms of our analysis of the decade immediately preceding.

Several developments in the world economy could have influenced movements in gold price. Our study, however, has led us to conclude that the gold price cycles in the last decade were generated principally by speculative behaviour. The speculative behaviour, in turn, was influenced by cyclical forces in the world economic system.

However, as we shall note, an

earlier study, covering a much more extended period, indicates that gold price has, in the past, not quite responded to cyclical economic forces. During the decade under review, certain special features of international economic developments, directly or indirectly, seem to have had an impact on gold price.

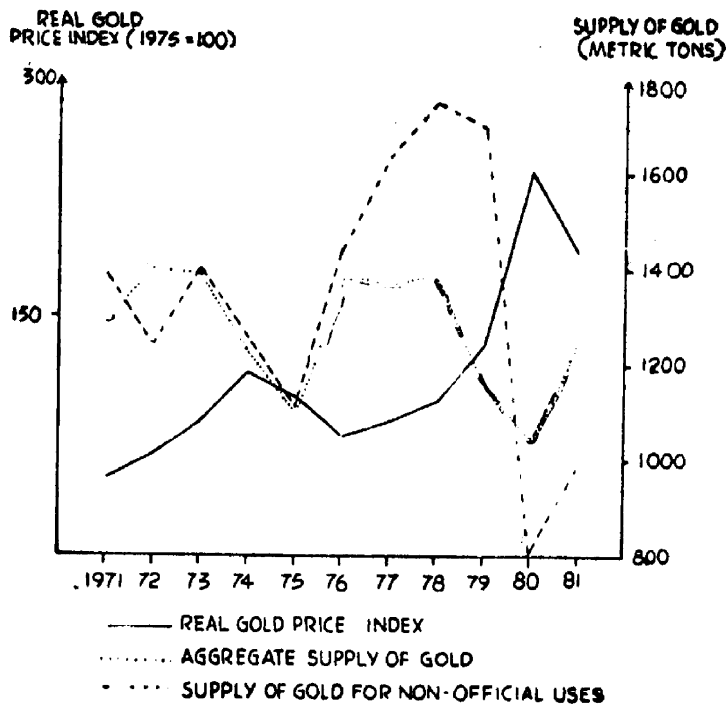
The paper is, therefore organised as follows; In section 1, we highlight the major changes in the world economy during the last decade. Section 2 attempts an analysis of the present international gold market and assesses the relative importance of the various major supply and demand factors. Section 3 concentrates on private investment demand for gold as distinct from the demand for jewellery, dentistry and industrial purposes. It is in this section that we discuss the role of speculation. The three sections which follow analyse the impact of factors possibly influencing speculation in gold. The factors we discuss are: (i) inflationary expectations, (ii) exchange rate fluctuations and (iii) interest rates changes. Gold price movements between July and September 1982 are analysed in Section 7.

TABLE 1: GROWTH TRENDS IN THE WORLD ECONOMY
(Average annual rate over a four-year period)

| | 1968- 1972 | 1970 1974 | 1972- 1976 | 1974- 1978 | 1976- 1980 | 1977- 1981 | 1978- 1982 |
|----------------------------------|---------------|--------------|---------------|---------------|---------------|---------------|---------------|
| Growth rates of: | | | | | | | |
| (1) World gross domestic product | 5.6 | 4.9 | 4.1 | 3.4 | 3.9 | 3.0 | 2.6 |
| (2) World exports | 9.5 | 8.7 | 6.7 | 4.3 | 5.4 | 3.2 | 2.9 |

Note : Growth rates for 1981 are preliminary and for 1982 are forecasts.
Source : UN (1982), "World Economic Survey, 1981-82", New York, Table 1-2, p 9.

CHART 1



Source : 1) Commerce, 1982, pp 1116-7.
2) IMF, International Financial Statistics, various issues.

The paper ends with some concluding observations.

I

The International Environment

The following features of the world economy during the decade 1972-1982 are worth noting:

(1) There was an almost steady deceleration in world production and trade (see Table 1). This was accompanied by increasing unemployment rates. In the OECD countries unemployment rate doubled from 2.6 per cent in the 1960s to 5.3 per cent in the second half of the 1970s, and is projected to increase to 8 per cent in 1982.² The deceleration in production was also accompanied by rising inflation. The average inflation rate increased to 8-10 per cent in 1970s from 3-4 per cent in the 1960s.

(2) There was at the same time a large growth of the financial superstructure. Total outstanding international bank claims grew at 25 per cent per annum: in gross terms, international bank assets increased from about \$ 150 billion in 1970 to more than \$ 1,500 billion in early 1982 and in net terms (ie, net of inter-bank transactions), from about \$ 100 billion to about \$ 1,000 billion over the same period.³

(3) The increased financial activity

was accompanied by greater financial instability, as reflected in volatile interest rates and exchange rates. The world moved from a system of fixed exchange rates to a system of floating exchange rates, partially in 1971 and almost totally in 1973. The volatility of exchange rates partly reflected financial speculation. It also reflected varied national growth performances and policies. Moreover, the higher inflation rates in the 1970s were accompanied by greater volatility in national inflation rates as well as greater divergences between national inflation rates.

(4) OPEC the cartel formed by the major petroleum producers, effectively demonstrated in 1973-74 and in 1979-80 its ability to enforce substantial discrete increases in the nominal price of its petroleum exports and thereby achieve considerable improvement in its terms of trade.

II

The Gold Market

It has been estimated that the cumulative aggregate of gold ever mined would probably be in the range of 90,000 to 116,000 tons. Of this aggregate, more than 60,000 tons are possibly available today in the form of official and private holdings of bullion, gold and jewellery. Approxi-

mately half of the available stock, ie, about 30,000 tons, is held in the form of reserves by national monetary authorities.⁴

The annual *new* supply of gold in the 1970 has been in the range of 1,300 to 1,600 tons.⁵ The new supply, therefore, forms less than 3 per cent of existing aggregate stock and about 6 per cent of monetary stock. The Russians produce around 300 tons and the Chinese about 50 tons every year. The rest of the new supply comes from the non-communist countries. In recent years, South Africa has been producing 650-700 tons, which is about 70 per cent of non-communist production. Aggregate non-communist production has however tended to decline over the 1970s, primarily on account of a continuous fall in South African production from 975 tons in 1971 to 650 tons in 1981.⁶

Our discussion below relates only to the non-communist gold market. The total annual supply of gold in the non-communist countries for official and non-official uses is obtained as the sum of current production in the non-communist countries and the net exports of the communist countries. This aggregate, when adjusted for official transactions, gives the annual gold supply for private purposes.

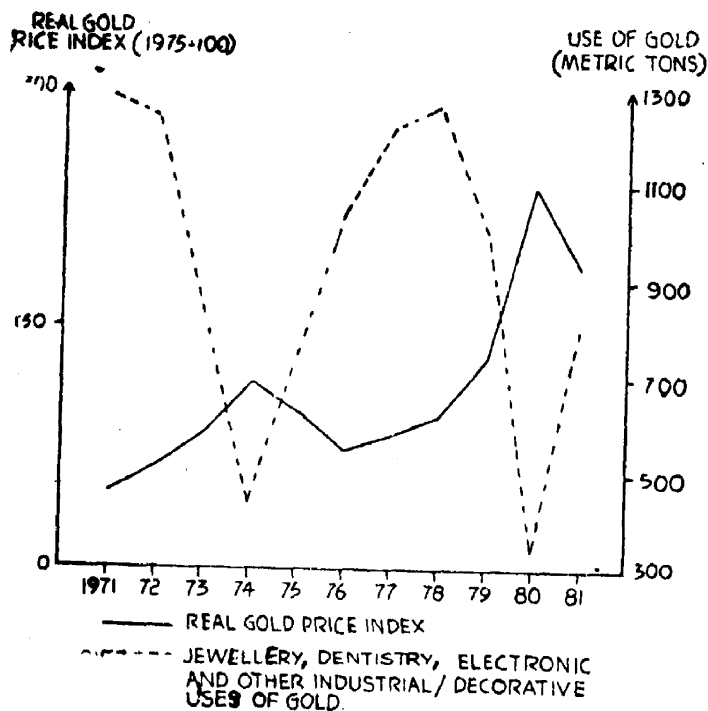
On the demand side, jewellery demand, though fluctuating, has constituted most of the private demand. In five of the 11 years between 1971 and 1981, jewellery demand was around 1,000 tons, which worked out to 80 per cent or more of the available supply for private uses. The demand for jewellery, however, fell to as low as 120 tons in 1980, which was 15 per cent of available supply. Between 200 and 250 tons have each year been taken up by dentistry and industrial uses. The rest has gone into coins and bullion holdings. The last category of demand, ie, the demand for bullion, is derived as a residual.

In our analysis we refer to the demand for jewellery, dentistry and industrial purposes as constituting the current consumption demand for gold, and the demand for coins and bullion as constituting the investment demand for gold.

SUPPLY AND DEMAND FACTORS

In the accompanying Charts, gold price has been plotted against gold supply and non-official demand components. Here, as in further analysis, gold price (expressed in US dollars)

CHART 2



Source: As in Chart 1.

has been deflated by the UN export price index of manufactured goods (which is also based on US dollar prices). This deflation has been performed in order to isolate factors operating in the gold market from influences on gold price, reflecting only changes in the US dollar exchange rate or general inflationary trends. The manufactured exports price index has been used as an index of general inflationary trends on the understanding that prices in the manufactures sector set the pace to prices in other sectors.

From Chart 1 it may be seen that cyclical movements in gold price can be explained neither by variations in aggregate supply for official and non-official purposes, nor by the variations in the supply only for the latter. The current consumption demand, i.e., the demand for jewellery, dentistry and industrial uses, is also unable to explain gold price changes (see Chart 2). Indeed, there appears to be an inverse relationship between consumption demand and real gold price, which indicates that gold price influences this demand rather than *vice versa*.

The demand for bullion, which as indicated above is derived as a residual, seems to follow the curve of the real gold price reasonably well. Moreover, if this demand is expressed as a proportion of the supply to the non-communist private sector, there appears

a very close correspondence between the direction of the year-to-year movements of gold price and the demand for bullion (see Chart 3).

If to bullion demand we add the demand for official coins to represent the aggregate investment demand for gold, we find that the gold price moves almost completely in sympathy with the investment demand (see Chart 4). It, therefore appears that gold price during the last decade has been determined primarily by changes in investment demand.

III

Investment Demand for Gold

Often investment demand is thought to consist of two components: a speculative demand (in expectation of a [relative] price rise and hence a capital gain) and hedging demand (also in expectation of a [relative] price rise but more with a view to preventing a loss in the real value of assets [particularly currencies] held). Following Machlup, however, we regard all of investment demand for gold as speculative in nature, regardless of whether it is in anticipation of price rise of gold or to insure against expected loss in the value of other assets. According to Machlup: "...any purchase of gold in expectation of an increase in its price shall be characterised as speculative.... Most

buyers of gold, seeking merely protection against inflation, do not regard themselves as speculators; but for purposes of analysis it makes no difference whether a purchaser wants to avoid loss from the depreciation of money or whether he seeks capital gain from the appreciation of gold." (Machlup 1969, pp 333 and 340.)

FACTORS AFFECTING SPECULATION

We have seen that gold price in the last decade has been determined mainly by investment demand for gold which, as we have noted, is altogether speculative in nature. That then raises the further question: what are the factors influencing speculative demand for gold? In the current international economic environment, gold price may be expected to rise when: (a) inflationary expectations are generated on account of rapidly rising price; and (b) exchange rates fluctuate rapidly. The first factor creates an expectation of depreciation in the value of currencies. The second reflects uncertainty in the expected value of currencies as well as general uncertainty in the economic environment. Higher inflationary expectations and exchange rate fluctuations may, therefore, be expected to result in some movement out of currencies. Such movement out would, in part, create greater investment demand for gold, raising the gold price.⁷

On the other hand, since gold is a non-interest bearing asset, large increases in interest rates may be expected to discourage holding of gold, given the expectations with respect to the appreciation in the price of gold.

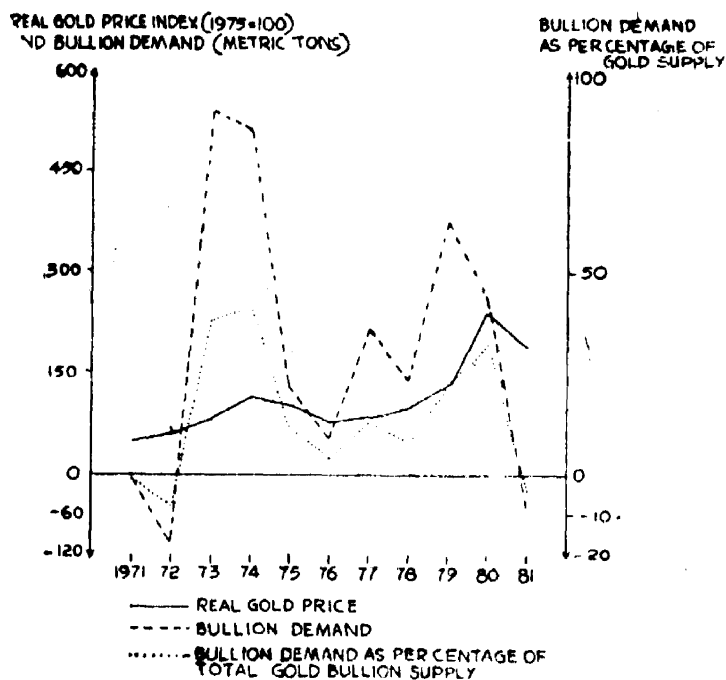
In the following sections, we, therefore, discuss the influence on gold price of inflationary expectations, uncertainty in the foreign exchange markets and interest rates changes. In discussing changes in interest rates, we also get some clues to understanding the cyclical behaviour of gold price,

IV

Inflationary Expectations

How do the rate of inflation and inflationary expectations react on the investment demand for gold? This is the question to which this section is addressed. Assuming that inflationary expectations are based on the rate of price increase in the previous year, we first consider petroleum price increases since these have significantly

CHART 3



Source: As in Chart 1.

contributed to inflationary expectations in the last decade and then look into the overall inflation rates, as reflected in the movements of the price index of manufactured exports,

PETROLEUM PRICE

In Chart 5, real gold price has been plotted against the rate of increase of nominal petroleum price in the previous year. It will be noted that in a number of years gold price and the rate of increase (or decrease) of petroleum price move in the same direction. However, the correspondence is not complete. This may be seen more sharply from Chart 6 which has been plotted using quarterly (rather than annual) observations. Essentially, petroleum price changes 'explain' the accentuation of the uptrend in gold price. They do not, however, 'explain' the start of the uptrend. This is so particularly for the upward phase of the second cycle starting towards the end of 1976. Petroleum price remained steady in nominal terms and declined in real terms as gold price began to move up.

GENERAL INFLATION

In Chart 7, real gold price is plotted against the rate of inflation (rate of growth of the export price index of manufactured goods) in the previous year. The rate of inflation in the previous year shows a close relationship in directional movements with

the real gold price. In particular, the two curves trace out the same cycles. However, the relationship fails to hold in 1979-80. The large rise in 1979-80, we find, was related not to the general inflation rate but to inflationary expectations based on the sharp rise in particular commodities of critical importance, such as petroleum (which was discussed above) and food (see Chart 8).

The implications of the observed relationship between general inflation and gold price should be noted. In an inflationary period, the real gold price has tended to increase. But the real gold price is the nominal gold price deflated by the price index of manufactured exports, which is also the index we have used to measure general inflation. Thus in an inflationary period, the nominal gold price, has tended to increase faster than general inflation, i.e., the purchasing power of gold has increased.

It is worth noting at this point that upward movement of real gold price during a period of boom in prices is, historically speaking, a new development, Jastram, who has studied the history of gold price between 1360 and 1976, has concluded:

To repeat, the evidence is convincing...: when inflation sets in, the purchasing power of gold declines (p 172).

Also,

... gold is not a satisfactory hedge against inflation (but does very well in periods of deflation)..., (p 178). According to Jastram, gold price has, in general, not matched the cyclical swings in prices.. During the upward phase of a price cycle, gold has lost its purchasing power. During the deflationary phase, gold has continued its steady rise and caught up, to say, with the general price level, thus maintaining its purchasing power over a cycle and in the long run. However, Jastram himself notes a deviation from this behaviour in the first half of the 1970s (Jastram, 1976, p 172), when gold increased its purchasing power in an inflationary phase. Our findings, covering the whole decade of the 1970s, show that the pattern of the first half of the seventies has continued into the second half.

The relatively new phenomenon of real gold price rising in a period of cyclical upswing is due probably to the growth of the financial superstructure (referred to in section I above). Moreover, it cannot be overlooked that inflation in the seventies has co-existed with deceleration in productive activity, a phenomenon often referred to as stagflation. Could it be that speculative investment in gold offers higher expected returns than productive activity in such circumstances?

V

Exchange Rate Behaviour

After the Second World War, the US dollar emerged as the most impor-

TABLE 2: UNCERTAINTY AND GOLD PRICE

| Year | Exchange Rate (S/D/M) Fluctuations | Real Gold Price Fluctuations | Real Gold Price |
|------|------------------------------------|------------------------------|-----------------|
| 1972 | 0.606 | 5.36 | 62.51 |
| 1973 | 4.739 | 7.95 | 85.35 |
| 1974 | 3.064 | 8.53 | 113.32 |
| 1975 | 2.510 | 4.19 | 100.00 |
| 1976 | 0.977 | 5.13 | 76.69 |
| 1977 | 1.481 | 3.64 | 84.88 |
| 1978 | 2.424 | 3.94 | 96.52 |
| 1979 | 1.207 | 5.81 | 133.87 |
| 1980 | 2.622 | 13.43 | 239.36 |
| 1981 | 3.664 | 5.96 | 190.65 |

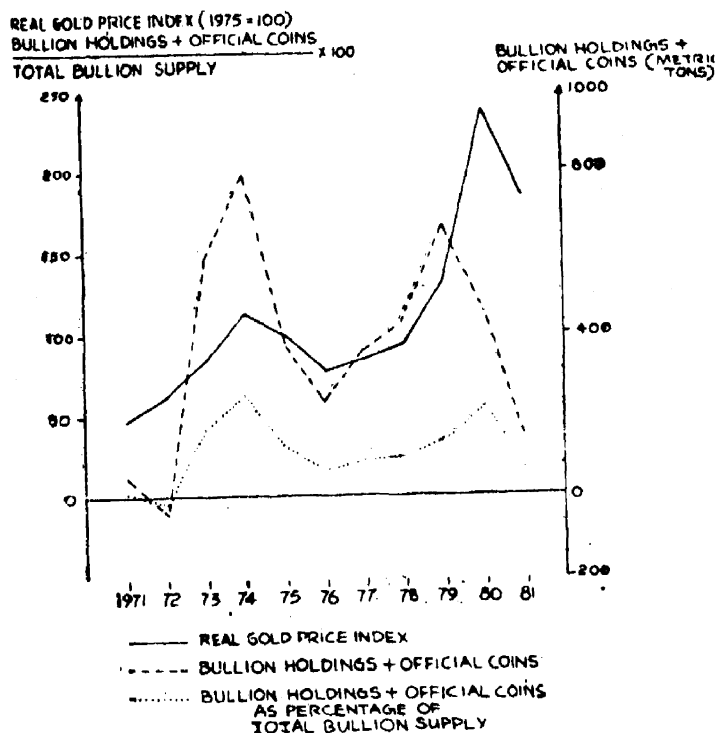
Source: (1) IMF, *International Financial Statistics*, various issues.

(2) UN, *Monthly Bulletin of Statistics*, various issues.

(3) RBI, "Report of currency and Finance", various issues.

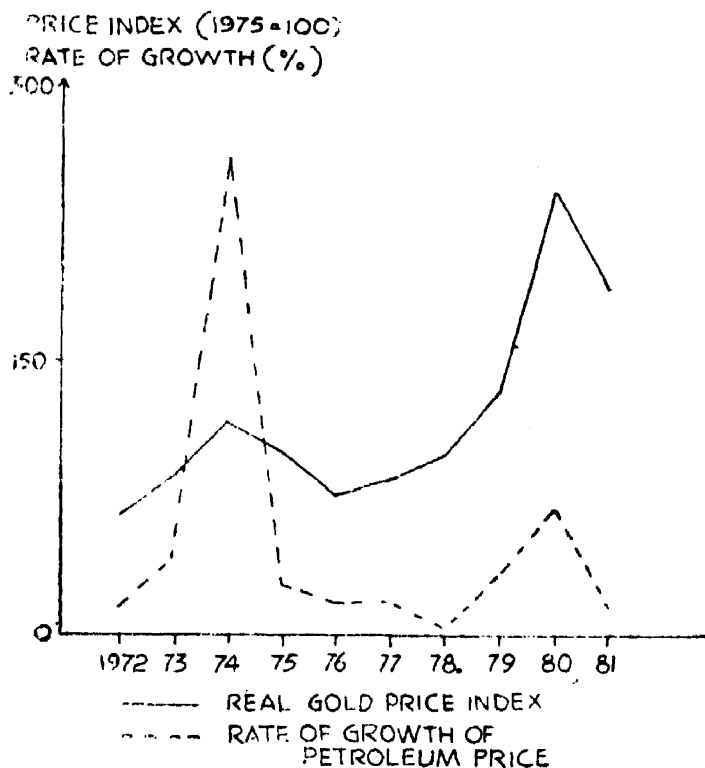
Note: Fluctuations have been estimated as the standard deviation of monthly percentage changes.

CHART 4



Source: As in Chart 1.

CHART 5



Source: IMF, International Financial Statistics, various issues.

tant international currency. The dollar's dominant position arose principally from the strength of the US economy: its large share in world production and trade, its well-developed financial markets and its stable price level. Also, the fixed exchange rate system that

was hammered out at Bretton Woods accorded to the US dollar the role of the one and only reserve currency.

In the 1950s, dollars necessary for financing world trade and for building up international reserves were in short supply. However, with the US export-

ing a large amount of long term capital and later running large current account deficits in addition, dollar balances outside the US grew rapidly and by the mid-1960s, the dollar began to come under pressure. The US found its monetary gold stock depleting in its attempt to maintain the gold value of dollar (@ 1/35th of an ounce). In 1971, therefore, the US suspended dollar convertibility in gold and also devalued the dollar. In 1973, the 'fixed' exchange rate system itself was abandoned in favour of the 'floating' exchange rate system (under which market forces, subject to central banks' intervention from time to time, determine the exchange rate alignments).

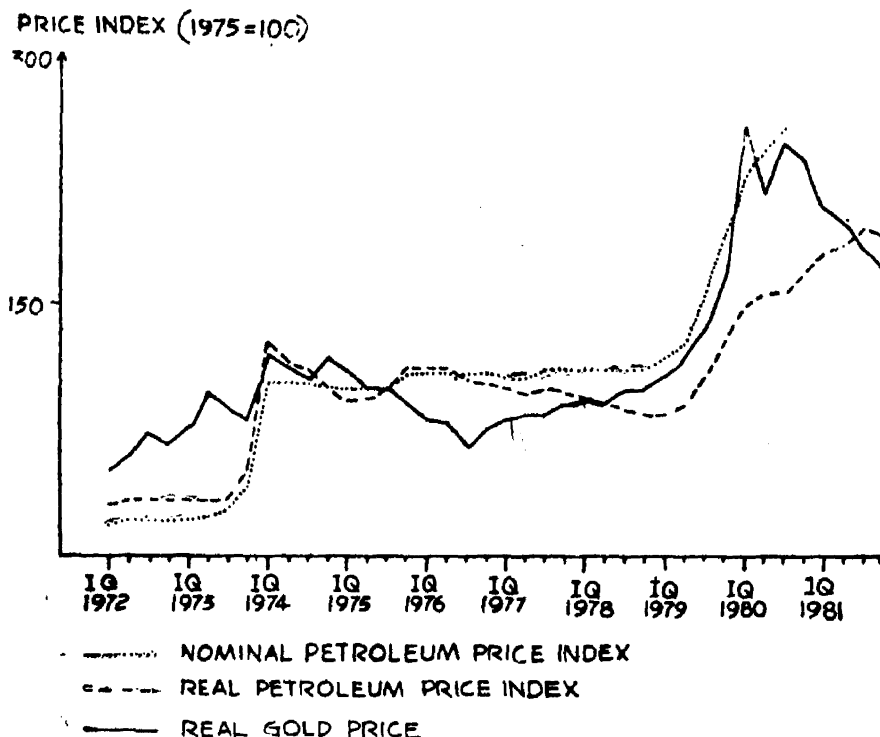
It was only to be expected that with the freeing of gold price and exchange rates, asset portfolios of the central banks and private investors would change. A financial portfolio may be changed either to increase the expected rate of return (or yield) or to reduce the riskiness of the expected yield. A recent study shows that the structure of expected real returns of currencies changed in the 1970s creating a strong incentive to move out of the dollar into other currencies mainly Deutsche Mark, Swiss Franc and the Japanese Yen (see Dombusch, 1980). The share of the dollar in the foreign exchange reserves of national monetary authorities declined from 87 per cent in the fourth quarter of 1976 to 61 per cent in the fourth quarter of 1980. Over the same period, the share of the Deutsche Mark increased from 7 to 11 per cent, of the Swiss Franc from 11/2 to 3 per cent and of the Yen from 1 to 3 per cent. The share of the dollar in international lending declined from 74 per cent in mid-1976 to 65 per cent in mid-1980.⁸

Similarly, Kouri and de Macedo (1978, p 122, Table 1) have estimated that over certain periods in the 1970s gold would have had a higher rate of return than any currency. Expectations based on such high realised returns probably created an incentive to diversify into gold and contributed to the secular rise in gold price, as seen in the higher peak of the real gold price in the second cycle.⁹

EXCHANGE RATES' VOLANTARY

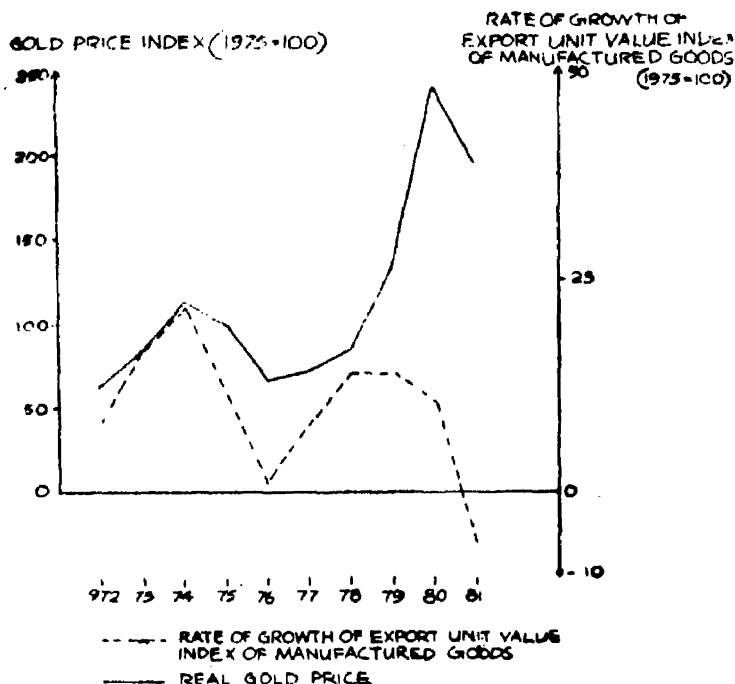
But can exchange rate movements throw any light on the cyclical movements of gold price? To examine this question we looked into the fluctuations in exchange rates. The measure of fluctuations used was the standard deviation of monthly percentage

CHART 6



Source : As in Chart 5.

CHART 7



Source : 1) IMF, International Financial Statistics, various issues.
2) UN, Monthly Bulletin of Statistics, various issues.

changes in exchange rate¹⁰ and it was applied to the \$/DM exchange rate. From Table 2 it may be seen that the real gold price has increased with increasing exchange rate fluctuations and declined with decreasing exchange rate fluctuations.¹¹ The exchange rate fluctuations trace out the same cycles as the gold price.

The relationship observed needs to

be explained. On the one hand, it could be argued that rising exchange rate fluctuations create an incentive to diversify the asset portfolio in order to minimise risk. Because of the heavy concentration of the dollar in asset portfolios, diversification basically implies a movement out of dollars into either other currencies or into gold. Thus in a period of increasing ex-

change rate fluctuation, the investment demand for gold rises, and hence gold price goes up.

However, it would also be noted from Table 2 that fluctuations in real gold price (estimated in the same way as exchange rate fluctuations) are consistently greater than the exchange rate fluctuations. It, therefore, hardly seems right to argue that diversification out of currencies into gold in periods of highly fluctuating exchange rate is primarily a risk minimising movement.

It should be noted in this context that though gold price fluctuations have been greater than exchange rate fluctuations, the two have tended to increase and decrease together.¹² Thus, it could be interpreted that the two sets of fluctuations are basically indices of uncertainty in the world economy. Increased uncertainty creates greater incentive for speculation. Hence in periods of high uncertainty, as reflected in the high fluctuations, the investment demand for gold goes up and, gold price, therefore, rises.

To link up with our previous section it will be noted that higher expectation of inflation rates has in general been accompanied by greater uncertainty, both reinforcing the incentive to invest in gold.

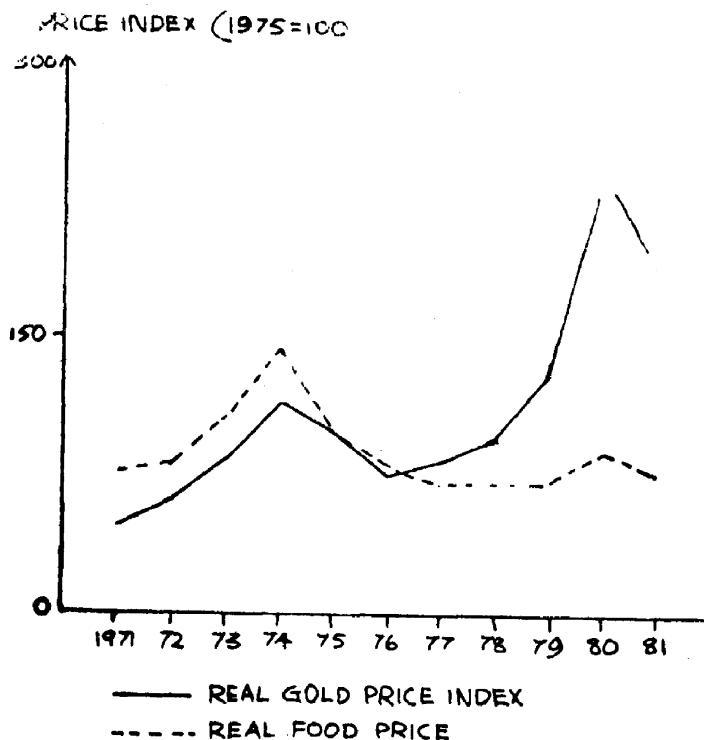
In 1981, however, exchange rate instability rose while inflationary expectations declined. Gold price fell, presumably, under the combined influence of lower inflationary expectations and high interest rates which had raised the opportunity cost of investment in gold. The large exchange rate fluctuations which co-existed with the fall in gold price and inflationary expectations reflected volatile interest rates and major divergences in national interest rates.

In the next section, we examine in some detail the influence of interest rates on gold price.

INTEREST RATE CHANGES

Since gold does not earn an interest, a rise in interest rates, *ceteris paribus*, reduces the attractiveness of gold *vis-a-vis* interest earning assets of comparable liquidity. We plotted interest rates (US 3-month money market) against real gold price (see Charts 9 and 10). The Charts are quite striking. Instead of the inverse relationship that may be expected from the above *ceteris paribus* reasoning, the two curves move reasonably parallel to each other, interest rates showing the same cyclical tendency, (This may be

CHART 8



Source: As in Chart 7.

CHART 9

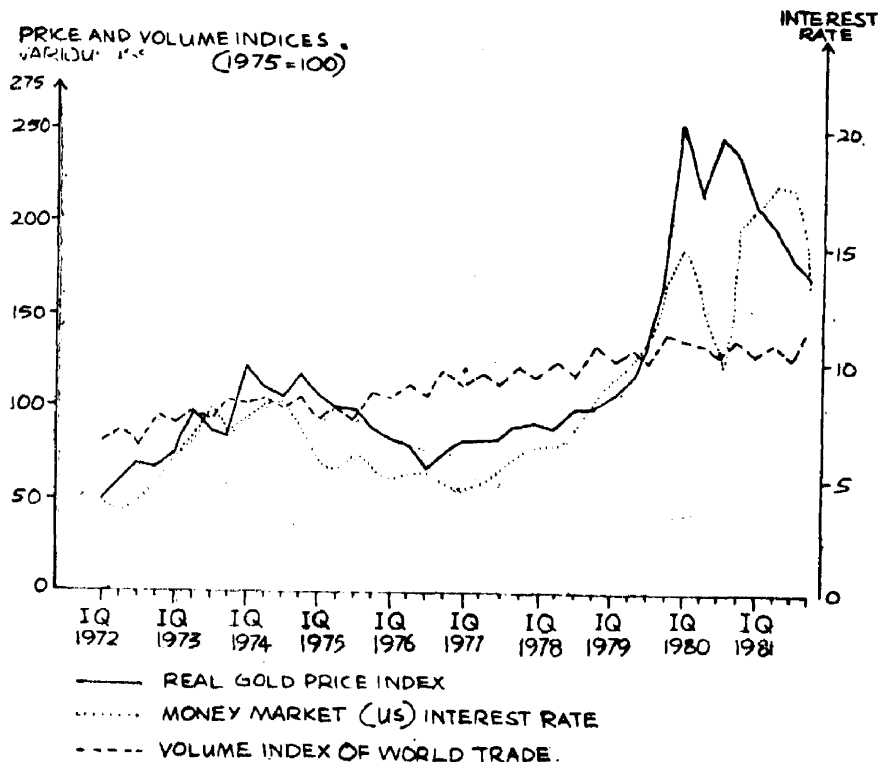


CHART 9

Source: As in Chart 7.

cade, we make a digression into the relationship between business cycles and interest rates.

BUSINESS CYCLES AND INTEREST RATES

At least as far back as Marshall, it was noticed that interest rates are positively correlated with business activity over most of a business cycle.¹³ A more recent statement has been made by Cagan:

... at first investors look favourably on capital projects despite the accompanying rise in interest rates; but if the rising cost of capital eventually exceeds expected returns, the resulting reduction in investment expenditure could bring a downturn in business activity. Then as the downturn gathers momentum, business prospects dim even further and the remnants of optimism fade. Investment undertakings previously held back by high interest rates no longer appear attractive even when rates are much lower. If cutbacks in demand for capital funds are large, interest rates will decline. (Cagan, 1969, pp 3-4.)

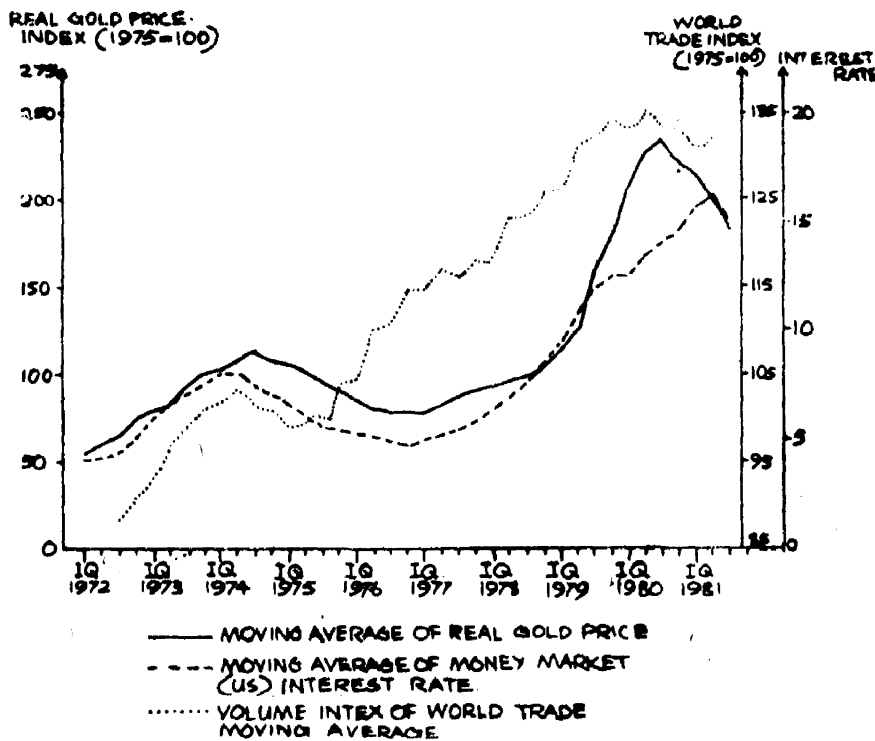
To return to our basic theme, it appears unlikely that the investment demand for gold is large enough to pull up or push down the interest rates. A more plausible explanation seems to lie in the basic positive link between interest rates and economic activity. That this link also held in the last decade may be seen from Charts 9 and 10, where world trade has been used as a proxy for general economic activity. The reasoning then proceeds as follows: a rise in economic activity during the last decade increased the demand pressure in the markets for good and services and led to an acceleration of prices; this raised inflationary expectations and created greater uncertainty, which in turn had the effect (as discussed above) of raising the gold price; increased economic activity also increased demand for funds, which led to rising interest rates; gold price and interest rates were thus seen to rise together; on the downward phase of the business cycle, interest rate and gold price fell as the demand pressure in the capital and goods markets respectively declined.

While this appears to be the general picture, in 1980-81 there was difference. Economic activity (as measured by the world trade index) stagnated after having grown only marginally in the previous year. This put a downward pressure on prices. The consequent decline in inflationary expectations would have pushed gold price down in any case. In addition, inte-

seen particularly from Chart 10 where moving averages have been plotted to smoothed out temporary fluctuations.) Only from the first quarter of 1980 to the first quarter of 1981 do interest

rates and gold price move in opposite directions, To explain the positive correlation between interest rates and gold prices, which held over most of the last de-

CHART 10



Source : As in Chart 7.

rest rates, which normally decline (with a short lag) alter general economic activity slows down, did not fall; instead they rose. The rise in interest rates despite weak demand conditions has been ascribed to the effects of the current US economic policy. For our purposes, it would appear that high interest rates reinforced the effect of lower inflationary expectations in pushing down gold price.

VII

Recent Gold Price Movements

In our discussion thus far, we have not considered the influence on gold price of political upheavals, wars, national bankruptcies, runs on banks, etc. Such special events do influence gold price and sometimes quite considerably. They bring in an additional element of uncertainty and tend to raise the gold price. Our justification for ignoring these events in explaining the price movements over the last decade lies in that these special events do not explain the long term gold price movements; their impact is of short duration, however large may be the immediate magnitude of that impact. Such events only modulate the underlying movements of gold price. Thus, the Iran-Iraq confrontation which broke out during the upward phase of gold price cycle possibly created an additional uncertainty and

led to gold price sky-rocketing to \$ 850 an ounce in January 1980. On the other hand, the Polish crisis, which had at least as much international significance as the Iran-Iraq crisis, occurred during a period when gold price was on the downward phase: although there were some blips in the gold price graph, no new record levels of gold price were reached.

It is not being suggested that in discussing long-term movements one can altogether ignore either the effect of special events or the significance of short-term changes in gold price. Indeed, short term changes need to be studied carefully, but their significance can best be understood in the framework of basic long-term forces.

We noted at the outset that, gold price having reached a sort of trough around \$ 300 an ounce, started moving upwards in June 1982. Till early September the price rose and reached a peak of a little over \$ 500 an ounce. Then it once again fell, reaching about the \$ 400 an ounce level.

These recent gold price movements may be related partly to changes in interest rates. As we discussed above, lower interest rates reduce the cost of holding gold and therefore enhance the demand for gold, pushing its price up. Broadly, the rise in gold price from the third week of June to early September was accompanied by falling interest rates, and the subsequent fall

in gold price was accompanied by an edging up of interest rates. But interest rates were clearly not the main influence. It is significant that while gold price started rising in the third week of June, interest rates started falling only in the first week of July.

The rise in gold price from the later half of June seems to have followed the behaviour of commodity prices. From early 1980, commodity prices had been falling. But in the third week of June, metal prices started moving up and all other commodity prices hardened. Between June 22 and July 20, the *Economist* index of metal prices registered an improvement of 13 per cent while all other components of the commodity price index remained stable. It is not clear at this stage what this partial reversal in the commodity price trend was due to. But it appears likely that it contributed to inflationary expectations and hence to a rise in the investment demand for gold. It is worth noting that in September both gold price and the commodity price index fell.

Though interest rates and commodity prices seem to have influenced the recent mini-cycle in gold price, the large amplitude of the cycle is probably explained by the Mexican payments crisis and the subsequent fears of default on debt by other developing countries heavily indebted to international banks. The sharp appreciation in gold price in August (of the order of \$ 100 an ounce) was in motion by Mexico's troubles with the commercial banks. Though the operation of rescuing Mexico was instantaneously mounted by the Bank of International Settlements, the price of gold continued to rise into the first week of September as the fear spread that other major developing country borrowers, such as Brazil, Argentina and Chile, were about to default on their debts.¹⁴

The Mexican crisis came when gold price was moving up. So it appears that the reaction to the Mexican news only exaggerated for a while the trend which had already been set. The sharp fall thereafter, represented a correction adjustment to the exaggerated upward movement,

VIII

Conclusions

Our study of the international gold price movements¹⁵ indicates that the real gold price (nominal price deflated by the price index of manufactured exports) moved to a cyclical fashion

during the last decade. The gold price cycles were, it, appears, caused by speculative investment in gold. The speculative behaviour, in turn, was influenced by the underlying cycles of economic activity (which were represented by the index of world trade). Increasing economic activity was accompanied by inflationary expectations and increased the extent of uncertainty (as reflected in increased exchange rate and gold price fluctuations). An incentive was therefore, created to increase speculative investment in gold, which then pushed up the gold price. Decreasing economic activity had the opposite effect.

In general, we found that interest rates did not have a significant dampening effect on gold price. Rising economic activity had the effect of pulling up gold price and interest-rates simultaneously. In the face of inflationary expectations and greater uncertainty, rising interest rates were not able to pull down gold prices. Also, in 1974-75, falling activity simultaneously had a depressing effect on gold price and interest rates.

Since mid-1980, however, interest rates have been high (rising sharply over certain periods) even under strong deflationary conditions. Thus gold price has been under the double depressing influence of a deflationary situation and high interest rates.

That speculative investment should have been the dominant influence on gold price reflects, probably, the greater opportunities for financial speculation and reduced expected returns from productive activity in the 1970s and early 1980s. Against the background of the relatively new phenomenon of 'stagflation' (long term deceleration in production and rising inflation rates), cyclical movements in economic activity created strong incentives for speculation in gold.¹⁶

The recent buoyancy in gold price, after the sharp fall till June 1982, raises the question whether gold price may now be expected to rise for some time. Our analysis suggests that in the short term gold price is unlikely to rise significantly since world economic activity, according to present projections, is not likely to rise and, therefore, inflationary expectations are likely to remain low; also, interest rates are not likely to fall much more. Gold price will, therefore, rise only if some international crisis develops, and exchange rates are violently disturbed, but such a rise may only be temporary.

For the long-run, other factors have to be considered. Experts who forecast

an upward trend in gold price rely principally on three factors. Firstly, they do not foresee any major breakthrough in either annual output or releases from the Soviet bloc. So new supplies of gold are expected to stabilise at the current level. Secondly, monetary authorities, which at one time played a significant role in the gold market, are not expected to release monetary stocks of gold. Thirdly, investment-cum-speculative demand for gold is expected, with all its ups and downs, to maintain a rising trend.

Even assuming that the new supplies of gold have no immediate prospect of expanding, the other two assumptions are not quite beyond doubt. The major sword hanging over the gold market is held by the monetary authorities who, as indicated above, control almost half the world stock of gold. The more they hold on to their stock without having much monetary use for it the greater is the likelihood that one day they may start divesting themselves of this stock. Such a divestment would, of course, depend upon the perception of gold's monetary role and the degree of co-operation amongst monetary authorities in the liquidation of monetary gold, should they decide on that course.

Also, the assumption that speculation will exercise an upward pressure on gold price depends not only on the judgment of investors on the likely long-term strategy of monetary authorities but also on the long-term trends in economic activity, particularly on the continuance of 'stagflation'. The path of the international price of gold is not as clearly indicated as is sometimes suggested.

Notes

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- 1 After 1961, Gold Pool was the institutional mechanism for keeping the nominal price of gold at a constant level. For details, see Einzing, 1972, pp 70-73.
- 2 *The OECD Observer*, March 1982, p 9.
- 3 The figures are collected by the Bank of International Settlements, and represent the external positions of banks in the Group of Ten countries. Switzerland. Austria. Denmark. Ireland and some offshore branches of US banks.
- 4 The details above are from Govett and Govett, 1982. pp 87-88.
- 5 The statistics on gold supply and demand flows used in this section are from *Commerce*, pp 111-67. which, in turn, has taken the figures from Consolidated Gold Fields Ltd. Annual Report, 1982.
6. Indian production in the 1970s has

been around 3 tons.

- 7 The reasons for preferring gold in inflationary and uncertain situations must be sought in traditional and psychological factors.
- 8 See Roosa *et al*, 1982, Tables 1 and 2. The expected rates of return on the dollar changed in mid-1980 with a large increase in US interest rates, and the share of the dollar in international lending increased thereafter.
- 9 The peak attained in January 1980 was partly influenced by the Iran-Iraq conflict. However, even in late 1979, the real price of gold was significantly higher than in December 1974, when the earlier peak was reached. (The role of particular events, such as the Iran-Iraq conflict, is discussed in section VII.)
10. The measure captures fluctuations around a trend represented by the average of the monthly growth rates.
- 11 The important exceptions are the years 1979 and 1981. These are discussed below.
- 12 Once again 1979 and 1981 are exceptions. In 1979, exchange rate fluctuations fell, while gold price fluctuations increased. This suggests that the high inflationary expectations in that year on account of the sharp rise in petroleum price (after four years of stability) resulted in an attempted movement out of all currencies into gold. The 1981 experience is discussed below in the main text.
- 15 See Marshall, 1923, p 257 and also Robertson, 1959, pp 80-82.
- 14 See the *Economist*, September 11, 1982, pp 80-81.
- 15 No corresponding analysis of the Indian gold price movements was attempted. From the Indian point of view, the difference between the international and Indian gold price is of critical importance. This difference principally determines the extent of smuggling of gold and hence the illegal movements in foreign exchange. Thus even from the Indian viewpoint, an understanding of international gold price movement is extremely important.
- 16 This raises some interesting questions on the relationship between speculative investment and its impact on the continuance of stagflation. We cannot go into these larger questions here. But one possible line worth pursuing seems to be the question whether the rise in speculative investment (in gold, commodities, currencies, etc) along with economic cycle uptrend chokes off the recovery. If it does, we would have a partial explanation why the recoveries have been lending to get shorter.

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Under-Enumeration in Indian Censuses Impact on Inter-Censal Population Growth: 1901-81

S Mukerji

There is a general belief that there has been undercounting in all the Indian censuses and that the extent of under-enumeration has been different in the different censuses, regions, and age and sex distributions. Official research and academic demographic research differ in their opinion on this.

The purpose of this article is to show that the omission rates in India have not been very high. However, knowledge of the true omission rate may not be enough if we want to assess the true natural growth in the decades. We also find that there has been a significant decline in the 1971-81 growth rate compared to that in the 1961-71 period.

THERE is a general belief that there has been under-counting of the population in all the Indian censuses and that the extent of under-enumeration has been different in the different periods, regions, and age and sex of enumerated population.¹ There appears to be considerable difference of opinion on the level of under-enumeration between the official circle (Census Commissioners and their co-workers in the Demographic Research Cells) and the demographic research workers in the academic field. The former believe that net omissions in Indian censuses were rarely more than 1 to 2 per cent of the enumerated population. Post-enumeration checks (PEC), following the 1951, 1961 and 1971 censuses, support that presumption and show a net omission rate of 17, 7 and 11, respectively, per 1,000 enumerated persons.

Analysis of extracts from all India census reports, prepared by D Natarajan,² also indicates similar outlook for the earlier censuses starting from 1872. The variations in the intercensal growth rates were explained mainly by the natural growth (births-deaths), bigger area coverage and more efficient enumeration. The effect of immigration and emigration on growth was considered to be very small. Quantitative assessment of the impact of quality of enumeration on the growth rate of the

population was also not possible. However, it does not mean that the census authorities were completely oblivious of the effect of omissions on the census counts. I may quote a brief paragraph from D Nataraja's study which runs as follows;

There is a suspected under-enumeration of population in the census of 1931, mainly in Gujarat, due to non-co-operation movement and over-enumeration in 1941 census in the Punjab and Bengal. The Census Commissioner for 1951 census has estimated the inflation in 1941 census at 20 lakh. (According to the census, India's population in 1951 was 356,787,299; so 20 lakh will mean 5.61 per 1000 enumerated population.)

The demographers of the academic circle, on the other hand, believe that the net omission rate in Indian population censuses were not low. Visaria³ raised a very pertinent question on the quality of the 1971 enumeration on the basis of the rather low rate of population growth between the house listing for the 1971 census (undertaken in 1970) and the actual census count of 1971, in at least three of the most populous states in north India. Unfortunately, his recommendations were ignored. Tim Dyson⁴ writing soon after the publication of the 1981 provisional population totals, expressed the opinion that "... the provisional total of 684 million is

almost certainly a substantial understatement of the country's true population size". Quoting from his own research, and from other eminent demographers' work, he concluded that 5 to 6 per cent under-count in some of the census enumerations is a distinct possibility. An under-count of only 2.3 per cent (not at all high in terms of international experience), in the 1981 census, would imply a true population of 700 million in 1981.

DOES KNOWLEDGE OF OMISSION HELP ASSESS TRUE VITAL RATES?

Knowledge of the omission rate in each census is essential if we want to know the true population size or its growth between the censuses. But perhaps a more important use will be its application in *assessing* the true decadal birth, death and net-migration rates. And precisely here I find that the knowledge of net omission rate *is* of very little value — unless some other things are also known. The reason is that most of the indirect methods for estimating birth or death rates from census data depend heavily on the age distribution of the population; and, as omissions by age and sex are usually not available, or are available in age groups which do not conform with the age groups in which the general population is tabulated, the age structure cannot be directly