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Evita Schmieg\*

## Factors Influencing Price Developments of Commodities

*Since developing countries are dependent to a large extent on the export of commodities, changes in commodity prices on world markets can have dramatic effects on living standards and on government budgets. The following paper examines the factors behind such changes and discusses the instruments which could be used to influence them.*

The exports of many developing countries consist to a large degree of commodities; quite often only one or a few commodities form the basis of almost the entire export earnings (e.g. Burundi: 68% coffee exports; Mali: 74% cotton; Rwanda: 81% coffee; Zambia: 83% copper).<sup>1</sup> Looking at the share of the leading commodities in total exports one will find only eight countries in Africa lying under 50%, but 22 countries over 85%. Six countries even show an export dependence on three leading commodities of 99%: Zambia, Uganda, Angola, Guinea, Somalia and Nigeria.<sup>2</sup> In many countries, the production of these commodities is at the same time the backbone of the domestic economy. There are quite a number of countries in Africa where exports of primary commodities exceed 20% of GDP.<sup>3</sup> This concentration of production and exports on a few commodities makes developing countries' economies especially vulnerable to external shocks. Price changes and the general price decline that took place in recent decades in major export commodities influence not only the foreign exchange situation of the respective country but can severely affect its economic performance in general. Where no internal price stabilization exists, international price changes directly influence farmers' incomes and thus the living standards of rural families. On the macroeconomic level, external trade quite often is the most important tax base, as developing countries lack the sophisticated tax system necessary for the collection of income tax and other direct taxes. Price changes can thus directly influence government budgets. As commodity prices sometimes fluctuate extremely, especially in the short and medium term, commodity dependent

developing countries lack a stable and predictable base for their development planning.

The purpose of this paper is to identify the factors that contribute to or evoke price changes of primary commodities. Special emphasis will be given to the role of commodity exchanges in price formulation and the extent to which they could be used by developing countries.

### Long-term Factors

The income elasticity of demand is defined as the percentage change in the quantity of demand for a good divided by the percentage change in real incomes (usually measured by GNP/capita). It thus gives an indication as to how the market prospects of a commodity change over time.

The income elasticity of demand for agricultural raw materials is below 1.0, with the lowest elasticities shown for food and beverages.<sup>4</sup> In developed countries (high GNP/capita), demand is less elastic than in developing countries (low GNP/capita). The income elasticity of demand for raw cotton, for example, is 0.07 in industrialised countries, 0.5 in developing countries.<sup>5</sup>

These figures show that the markets for commodities will lose importance in relative terms in the long run,

<sup>1</sup> UNCTAD: Handbook of International Trade and Development Statistics, New York 1991, Table 4.3.

<sup>2</sup> UNCTAD: Commodity Yearbook, New York 1990, Table 17.

<sup>3</sup> Ibid., Table 1.22.

<sup>4</sup> Commodity Prices: Investing in Decline?, ODI Briefing Paper, March 1988, p. 2.

<sup>5</sup> M. E. Thigpen: International Cotton Market Prospects, Washington 1978, pp. 29 ff.

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compared with finished goods and services. The commodities that are most affected by this trend are food and beverages. If people (and peoples) get richer, there will still be a limit to what they can eat and drink. For many people in industrialized countries the limiting factor for drinking coffee, for example, is not income, but health considerations.

There is one commodity group to which this general rule does not apply: metals. As metals are used as industrial inputs, the income elasticity of demand for them is well above 1.0, indicating that the growth of demand for metals exceeds income increases.<sup>6</sup>

The main factors tending to reduce income elasticity over time are the changes occurring in the patterns of industrial country demand and production, namely the movement away from industrial products in favour of services and the shift away from the heavy metal-using industries towards electronics.<sup>7</sup>

Commodity markets also interact with each other and the markets of substitutes. Examples are cotton, which is in competition with synthetic fibres, metal (e.g. in cars) with plastic, or copper with optical fibres in telecommunications.

### Supply-side Factors

An important factor contributing to the price changes during recent decades has been the tendency to over-supply. The balance of payments difficulties experienced by developing countries in the last decade and the lack of short-term alternatives for foreign-exchange generation contributed to a tendency to promote traditional commodity exports even when prices were declining. (This argument is supported by the fact that the price elasticity of production in the case of cotton, for example, was negative for a number of countries between 1967 and 1987.<sup>8</sup>) The policy of the World Bank and the International Monetary Fund at that time of encouraging short-term export promotion in traditional products on the basis of existing comparative advantages to encounter balance of payments problems may have contributed to that trend. It also has to be admitted that price expectations in developing countries during the 1970s were unrealistically high. The discussion on a New International Economic Order and Commodity Agreements as well as the "success" of the OPEC influenced thinking, expectations and production policies.

Commodity prices can be heavily influenced by deliberate market policies in producer countries. In cases where one producing country has a significant market share, it is able to exert a stabilizing effect on the market. This role was, for example, played by the USA on the world cotton market before 1985.<sup>9</sup>

On the other hand, a dominant supplier is also able to de-stabilize markets and to increase prices within certain limits by withholding production or to enter into ruinous competition in order to gain market shares (e.g. Brazil: coffee; Côte d'Ivoire: cocoa). However, the impact of this action is short-run and limited. The operators on the market are usually well informed on production and stock data as well as harvest forecasts, and these are the factors mainly influencing price formation on the markets. The price effect of withholding supply from the market is thus balanced to a certain degree by the knowledge that increasing stocks secure future supply. This also explains why the Côte d'Ivoire as the major supplier of cocoa finally did not succeed in increasing prices even in the medium term through different attempts to withhold production. It has to be remembered, however, that one single developing country generally neither has the dominant market position nor the foreign exchange reserves to follow such a withholding policy.

On some agricultural markets (e.g. grains, beef, sugar), industrialized countries' agricultural policies and subsidized exports contributed to a large extent to worldwide over-supply and the long-term price decline. These practices are the major stumbling block in the current multilateral trade negotiations, the GATT Uruguay Round. However, the agricultural reform of the EC that has recently been decided is a step in the right direction.

As the role of international commodity agreements and their advantages and deficiencies have already been discussed extensively, only one aspect will be mentioned briefly here. It has recently been pointed out that the International Coffee Agreement exerted a stabilizing influence on coffee production in the long run,<sup>10</sup> which may have prevented coffee prices from declining to the same extent as the prices of other agricultural commodities. The fact that producer countries themselves had to finance stocking during the periods when export quotas were in force, influenced the price, market, trade and production policies of the exporting countries. This long-term effect of

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<sup>6</sup> ODI Briefing Paper, op. cit.

<sup>7</sup> Ibid.

<sup>8</sup> Hartmut Brandt: Die Baumwollerzeugung afrikanischer Länder, Berlin 1989, Table A 24, p. 85.

<sup>9</sup> Cf. Hartmut Brandt, op. cit., p. 20; and Heinz Kolbe, Hans-Joachim Timm: Die Bestimmungsfaktoren der Preisentwicklung auf dem Weltmarkt für Baumwolle, Hamburg 1971, p. 9.

<sup>10</sup> Hartmut Brandt: Die Ausgestaltung eines neuen Internationalen Kaffee-Übereinkommens, Deutsches Institut für Entwicklungspolitik, Berlin 1991, p. 114.

the ICA since 1963 of course did not prevent severe price fluctuations (which were even reinforced by the temporary suspension of quotas under the agreement as well as the abolition of the agreement's economic clauses). The rigidity of the quota system may have had an additional effect on long-term price developments: as it reduced competition to a certain extent, it exerted a dampening effect on technical progress<sup>11</sup> and therefore prices.

Another supply-side factor influencing prices in the long run is technical progress in commodity production. As it reduces production costs and intensifies competition, it exerts a long-term downward pressure on commodity price levels. Technical progress on the consumption side leads to declining amounts of commodities needed as inputs for a given level of production.

### Medium and Short-term Factors

Most commodity markets show a medium-term cycle of interaction between prices and production capacity. It is caused by farmers responding to price signals by increasing investment or diminishing production. The length of the cycles varies depending on the lag between investment decisions and an increase in output. For food commodities the lag has been measured to be about four years, for agricultural raw materials about five years.<sup>12</sup>

However, this theoretically existing cycle can be distorted in reality by a number of factors. A governmental internal pricing policy can keep prices at levels above world market prices just with the aim of keeping up production and preventing a major decline in export earnings, a policy that has for example been followed by the cocoa export board of the Ivory Coast.

Commodities can be divided into groups for which the dominant short and medium-term factors influencing prices are different: short-term changes of supply, mainly caused by weather conditions, are the main factor determining the prices for food and beverages. For example, a significant proportion of the price variability in the international market for vegetable oil arises from the effects of weather on the US soy-bean crop or the effects of policy on US stockpiles.<sup>13</sup> Income elasticity for these commodities is low; demand is developing slowly, but stably.

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<sup>11</sup> Ibid.

<sup>12</sup> K. Chu, T. Morrison: *World Non-Oil Primary Commodity Markets: A Medium-term Framework of Analysis*, IMF Staff Papers, Vol. 33 (March 1986), pp. 139-184.

<sup>13</sup> World Bank: *Global economic prospects and the developing countries*, Washington D.C., May 1991, p. 20.

<sup>14</sup> International Monetary Fund: *Primary Commodities – Market Developments and Outlook*, Washington D.C., May 1987, p. 3.

Demand developments which are influenced by the business cycle are the main factor influencing the prices for industrial commodities (metals, ores, but also agricultural commodities). The short-term elasticity of supply for these products is usually higher than for food and beverages. The weakness of commodity prices in the 1980s compared with the 1970s is thus partly caused by a deceleration in the rate of growth of economic activity in industrial countries.<sup>14</sup>

The markets for energy commodities are oligopolistic and thus do not really correspond to market forces.<sup>15</sup>

Interest rates also affect commodity prices, although their impact is indirect, via their influence on the cost of holding stocks.

Exchange rate changes can influence the world market position of a commodity. Most commodity prices are denominated in US \$. Despite the large fall in the dollar price of commodities between 1981 and 1985, the prices of these commodities in terms of major European currencies and Japanese yen remained unchanged or even increased because of the appreciation of the US \$ against the currencies of these countries.<sup>16</sup> As long as European demand is not totally inelastic, such a price increase as expressed in European currencies leads to reduced demand.

### Structure of the Market

The structure of the market also plays a role in price formation. The oligopoly of the OPEC at the beginning of the seventies showed that an oligopoly on the supply side could form a cartel and heavily influence prices in the short to medium term. The situation then developed in a way which was to be expected. The high prices stimulated production by "outsiders" (outside the cartel) and led finally to a weakening of the cartel.

The world markets for finished products made from cocoa and coffee are dominated by only a few international firms. Their stocking policy for example is thus able to influence price developments of these commodities. However, these firms do not seem to have a medium or long-term coordinated strategy, as practical experience in the coffee sector shows. In 1988/89, the European coffee industry was lobbying intensively for a free coffee market, i.e. an International Coffee Agreement without economic clauses. They argued that under the Agreement with

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<sup>15</sup> Cf. H.-J. Timm: *Der HWWA-Index für Rohstoffpreise*, Bremen 1987, p. 11.

<sup>16</sup> Panos Varangis, Ron Duncan: *Exchange rate movements, commodity prices and export revenues*, in: *The Courier*, No. 116, 1989, pp. 83-86.

economic clauses the supply of high quality coffee was not secured and too expensive. Two and a half years after the breakdown of the agreement, the same industry is lobbying in favour of an agreement with economic clauses, arguing that high-quality coffee production is endangered because at the current low world market prices producers have started closing down their coffee plantations.

In fact, as the price of the raw input commodities forms only a small share of the price of the finished product, and as coffee still has the image of a high-quality, almost luxury product that need not be cheap, a low price for the commodity is not really at the centre of the industry's interest. Its main interest lies in a secure and stable supply of coffee in the qualities required. Obviously, this aim can under certain conditions be reached more easily with an agreement.

However, any analysis of price formation of commodities needs to look at the structure of the market, i.e. the number of suppliers and buyers and the possibility of cooperation between them.

#### World Markets

Some commodities are traded on commodity exchanges (cocoa, coffee, cotton, sugar, orange juice, metals, etc). These products have to be standardized to a

large extent. The fact that commodities are traded on exchanges (the most transparent markets) facilitates the linkage between the markets through arbitrage. In these cases one can speak of an almost uniform and transparent world commodity market. Futures prices obtained on the exchanges are often used as a reference for long-term contracts in direct trade.

Other commodities (iron ore, tropical wood, bauxite, manganese, jute, hard fibres, bananas, phosphates), in contrast, are to a large extent traded on a long-term basis in direct purchasing or even intra-group transactions.<sup>17</sup> Information on this trade is usually confidential. Thus neither the real volume nor the prices are known. Prices of long-term contracts, however, tend to be linked to price developments on the exchanges.

It seems that the commodity markets represent the theoretically possible extremes: either the world market for a given commodity is close to the theoretical model of the market or it is extremely far from this model.

The conditions of the functioning of a futures market are very close to the model of a "perfect market":

<sup>17</sup> The futures market and International Commodity Agreements (ICAS) 1989, in: *The Courier*, No. 116, reprinted from: UNCTAD secretariat bulletin No. 248, November-December 1988, pp. 68-69.

Hans W. Micklitz (ed.)

## Post Market Control of Consumer Goods

The Community has defined the objective of achieving the Internal Market by 1992. Efforts to open up markets by harmonizing divergent technical standards and regulations have involved the Community in product safety matters. This is now manifested in the Draft Directive concerning general product safety. The present study on post market control, conducted on behalf of the European Commission, looks at two ways in which the „Europeanization“ of the rules governing this area might take place. First, the post market control systems in selected Member States, in Australia, Sweden, and the United States are analyzed, so that the consequences and perspectives for the establishment of a European post market control system may be examined. Secondly, the findings of the comparative analysis of post market control in the Member States and non-EEC countries are contrasted not only against the mechanisms proposed for the harmonization of the Member States' legislation but also against the mechanism proposed to monitor product safety on a European level in emergency situations.

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- large numbers of buyers and sellers, no dominant positions;
- largely homogeneous and durable product;
- unhindered entry to the market;
- decisions and operations in the market are taken independently;
- information about the product's price, distribution, production and stocks position is available to the participants in the market.<sup>18</sup>

It is evident that these criteria are only met by a few commodities.

The activity of the futures market is facilitated when the commodity is generally produced in surplus, with at least a moderate carry-over remaining at the conclusion of each production year. The uncertainty of the producer in this situation, whether he will be able to sell the intended amounts in future at at least the same price as today, provides him with an incentive to fix the conditions of the future deal in advance. If the producer were assured of selling the total production at will, the necessity of limiting the speculative ownership risks by hedging would be greatly reduced.<sup>19</sup>

Even though futures markets are highly transparent, it has to be taken into account that less and especially least developed countries cannot really take advantage of this. Bad communication infrastructure and a lack of trained manpower in the area of commodity futures markets are the reasons for developing countries actors appearing on these markets only exceptionally.

### Speculation

What is the role of the futures market and speculation? The futures market provides a kind of "insurance" for the market participants, as it gives them the opportunity of having a fixed basis for calculation on a transaction taking place in the future, i. e. it offers protection against excessive price fluctuations to both producers and consumers of commodities. This transaction, when buyer and seller fix the future price in advance, bears of course the risk that the real market price will develop differently to these provisions, so that in the end buyer and seller are confronted with a theoretical loss/gain (if the seller sold "too cheaply" or the buyer bought "too expensively" in

comparison to real price developments). Buyer and seller can now cover a part of this risk by the so-called "hedging" operation, i. e. a buying *and* selling transaction at a price reflecting the opposite market view. The high number of "hedging" operations is the explanation for the fact that only a relatively small percentage of the futures contracts bought or sold on a futures market are ever actually delivered. The great majority of the contracts entered into are closed out (liquidated) before they fall due for delivery.<sup>20</sup> The volume of "physicals" (commodities) actually traded can be as low as one tenth of the contract volume.<sup>21</sup> This shows that a large part of the market actually consists of speculation.

Speculation has often been regarded as something negative and suspicious. "In London, speculation in commodities is officially frowned upon ... in the United States, there is a different attitude ...",<sup>22</sup> but over time the role of the futures market as an insurance has been underlined. A certain amount of speculation is even necessary for the functioning of the market. "One moral here is: do not knock the speculator. Hedging cannot be maximised unless a sufficient volume of producer, consumer, and speculator funds can be attracted. If one or two of these three vital parties takes an insufficient interest in the market, then the market will not have the depth and liquidity to remain viable."<sup>23</sup>

Nevertheless, it cannot be doubted that the behaviour of speculators can distort price developments to a substantial extent in the short run. This is particularly true, where the number of final consumers is low, as for example in the case of cocoa, where the raw commodity is mainly processed by only five multinational firms. The amount of deliberate market influence taking place will, however, always be difficult to assess because futures markets are highly dependent on imponderables such as expectations, personal judgements etc. The so-called "market sentiment" cannot be easily divided into objective and countable factors.

However, the structure of futures exchange markets with their high degree of transparency and high number of operators makes a deliberate short and medium-term influencing of the market in the interest of a few individuals quite difficult. In the long run, it will not be possible to influence the market against its natural trend because no one has the power to buy out the whole market.

<sup>18</sup> Brian Reidy: The Evolution of International Futures Markets, in: Brian Reidy (ed.): Guide to World Commodity Markets, New York 1977, pp. 15-20.

<sup>19</sup> Stanley Kroll, Irwin Shishko: The Commodity Futures Market Guide, New York 1973, p. 12.

<sup>20</sup> Ibid., p. 16.

<sup>21</sup> Serge Calabre: La Conjoncture sur les marchés internationaux de produits de base, contrainte pour le développement endogène, in: Revue Tiers Monde, Vol. XXVI, No. 104, October-December 1985, p. 797.

<sup>22</sup> John Edwards: Speculation on the Commodity Market, in: Brian Reidy (ed.), op. cit.

<sup>23</sup> Brian Reidy, op. cit., p. 19.

### Financial Markets

In recent years the World Bank has pointed out the importance of developing countries' being ready to use the financial markets to manage their risk exposure optimally and to reap the considerable benefits that have accrued to industrial countries as a result of the above-mentioned financial innovations. In 1989 the World Bank created a "Commodity Risk Management and Finance Unit" in the International Commodity Markets Division in order to provide technical assistance and respond to the commodity risk management and finance needs of developing countries.

In general, the costs of participating in the short-dated markets as described above are small – about  $\frac{1}{8}$  to  $\frac{1}{2}$  of a percent of the contract value. Hedging in these markets could thus also be undertaken by developing countries entities that have very limited access to commercial financing. For instance, Ghana and Côte d'Ivoire have on some occasions already become active on the futures markets.

This is different from the longer-term instruments of the financial markets. Since margin deposits are not usually required there, banks will normally deal only with counterparts above a certain level of creditworthiness. One of the main instruments, the commodity swap, will be described briefly. The producer agrees with the bank that semi-annually over the period of the swap contract (e.g. 2 years) he pays, or receives, the difference between the future market price and an agreed fixed price. The consumer signs a complementary contract with the bank, undertaking to pay or receive the difference between an agreed fixed price and a future market price.

These longer-term sales contracts give more security and stability with regard to future export receipts and thus a more stable basis for budget and development planning.

The long-term contracts are associated with so-called "transfer risks" (e.g. changing regulations relating to capital movements) and "sovereign risks" (political instability), which are not covered by existing insurance institutions. The World Bank therefore proposed for UNCTAD VIII that the First Account of the Common Fund for Commodities (which is not used at the moment) should be converted to a Commodity Insurance Fund. The First Account was devoted to financing the buffer stock of commodity agreements. The only agreement with buffer stocks in force at the moment, however – that on rubber – does not fall back on these funds. The amount already paid in (which is still not the total sum outstanding) is thus not currently used.

There was unanimity between governments and

institutions on UNCTAD VIII that the issue of commodities futures markets is of particular relevance for developing countries. The discussion on this issue will without doubt continue and intensify.

### Conclusions

A closer look at the issue of factors influencing price developments suggests again the old wisdom that the most important aim of a commodity policy remains diversification, not only into other commodities to reduce the immediate risk of price and export fluctuations but, above all, into semi-finished and finished products to counter the long-run decline in the relative importance of commodities in world markets.

The role of exchange-rate policies with regard to export promotion in commodity-dependent countries has to be regarded with care. The worldwide tendency to oversupply on commodity markets, the not very elastic demand and the danger of outweighing movements on world currency markets diminish the value of the exchange rate as an effective policy tool.

The view of the role and functioning of commodity agreements is worth a second thought. Of course, the expectations that have been put into these instruments in regard to short and even medium-term price stabilization have been disappointing. However, up to now there has not been much research as to the long-term effects of the agreements, namely the coffee agreement where export quotas ensured that the stocking costs had to be carried by the exporting country and thus possibly also influenced production policy. In spite of all the weaknesses of the agreement it might be worth continuing because of the long-term dampening effect on production increases.

Although the futures markets instruments cannot be used as a tool to increase commodity prices, they can however play a valuable role in insuring against the risk of heavy price fluctuations and making commodity export receipts a little more stable. Some countries are already engaged in the short-term markets, but because of their lack of creditworthiness they do not have access to medium-term instruments. It is worth considering whether development cooperation could step in:

- to enable developing countries through training to take advantage to a larger extent of the possibilities of futures markets. There is a risk that training in such an area with highly paid jobs could lead to brain drain; this risk has to be countered;
- by providing some kind of insurance to compensate the lack of creditworthiness of developing countries entities and thus to give them access to the medium-term markets.