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THE INTERNATIONAL TIN MARKET AND PUBLIC POLICY

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*2/3*

## INTRODUCTION

Although tin production and consumption is influenced by a variety of national policies, the dominant impact of public policy on the tin market has been through the operation of the International Tin Agreements. This study will focus on the ways in which the implementation of these Agreements have influenced the development of the tin market and impacted on both producers and consumers of the metal.

The study first explains the broad structure of the industry and outlines the major developments in production, consumption and trade over the past thirty years. This will provide the necessary background to our appraisal of the impact of the International Tin Agreements.

The second and third sections will examine the International Tin Agreements and the problems that arise in operating a buffer stock. The third section will concentrate on the events that arose with the operation of the Fifth and Sixth Agreements and look at the implications for the management of commodity agreements. The economic and political conditions determining the actions of the International Tin Council and its officers will be described with a view to developing an understanding of the forces which led to the collapse of the International Tin Agreement in 1985. The economic and political conditions determining the actions of the International Tin Council will be described with a view to developing an understanding of the forces leading to the collapse of the Sixth International Tin Agreement in 1985.

The next section of the paper looks at developments since the collapse of the tin agreements in 1985 to see how the market has adjusted to the new circumstances. Particular attention is paid to the development of alternative supply rationalization arrangements. A conclusion summarizes the implications of the operation of the agreements for the long-term structure of the industry.

### THE TIN INDUSTRY

In certain important respects the world tin industry is one in which there have been relatively few changes over the past sixty years. Indeed, a comparison of the broad aggregate figures for production and consumption (Table 1) shows just how little change there has been. In contrast to virtually all other metals there has been virtually no growth in both production and consumption over the period despite the growth in industrial output.

Table 1: World Production and Consumption of Tin 1929-1986  
(Thousand Tonnes)

<u>Year</u>	<u>Production of Tin-in-Concentrates</u>	<u>Consumption of Tin Metal</u>
1929	192.5	174.1
1950	164.7	149.9
1960	138.5	165.0
1970	186.3	174.2
1980	200.0	175.0
1989	172.0*	187.0*

\* Estimated

Sources: W. Robertson, Tin: Its Production and Marketing, Croom Helm, 1982; International Tin Council, Tin Statistics, 1976-1986, London, 1987; UNCTAD, International Tin Statistics, Bulletin No 4, February 1990.

Table 3: Consumption of Tin Metal (Tonnes)

<u>Country</u>	<u>1980</u>	<u>1988</u>
USA	44342	37600
Japan	30917	32164
EC	49196	56479
Other OECD	10649	10070
Non-OECD	39896	51487
Total	175000	187800

Sources: International Tin Council, Tin Statistics, 1976-1986, London, 1987; UNCTAD, International Tin Statistics, Bulletin No 4, February 1990.

Information collected by the International Tin Council [Robertson, 1982, p.30] provides useful insights into relative production costs and reveals marked differences between those parts of the world where tin is found in alluvial deposits and extracted by dredging and those areas where tin is produced through underground lode mining. The study reveals that in the 1970's the highest cost producers faced costs three times those of the lowest cost producers. It is an interesting feature of the market that the industry contained over a long period of time such a wide dispersion of production costs. Indeed, it will be argued that the success of the International Tin Council in sustaining prices above their true market level was important in retaining the high cost producers within the industry. By the same token these policies tended to lessen the advantages to be gained by lowering production costs and reduced the incentives for mines to introduce cost-saving technologies.

The structure of international trade is very simple. Most smelting takes place near to the place of production and most international trade is in tin metal rather than in tin concentrates. Table 4 indicates the country of location of

smelters in excess of 10,000 tonnes and shows not only the wide distribution of these facilities but also that they are located primarily in producing countries.

Table 4: Location of Major Tin Smelters, 1986

<u>Country</u>	<u>Company and Smelter Location</u>	<u>Annual Capacity</u> <u>('000 tonnes)</u>
Bolivia	COMIBOL, "Alta Ley" (Vinto)	16.8*
Brazil	Mamore Mineracao e Metalurgia (Sao Paulo)	30.0*
China	State Tin Enterprise, (Gejiu, Yunnan) (Leiping, Guangxi)	10.0* 6.0-12.0*
Indonesia	PELTIM	26.0*
Malaysia	Datuk Keramat Smelting (Georgetown)	60.0**
	Malaysia Smelting Corp. (Butterworth)	60.0**
Nigeria	Makeri Smelting (Jos)	18.0**
Thailand	THAISARCO, (Phuket)	38.0*
UK	Capper Pass (Humberside)	23.0*

Notes

\* Tin metal

\*\* Tin-in-concentrates

Source

International Tin Council, Tin Statistics 1976-1986, pp. 12-13, London, 1987.

Consumption has always taken place primarily in the industrial OECD countries (see Table 3). For the most part communist countries have enjoyed a broad balance of production and consumption and have only entered into international trade from time to time to acquire or sell relatively small amounts of the metal. The stagnation of consumption, illustrated in Table 1, can be explained by two main factors, which assume different importance in different OECD countries [Castro, 1988]. First, the high price of tin has encouraged the substitution of tin by other materials as well as encouraging economy in the use of tin. This decline in intensity-of-use has been particularly important in the United States. Second, in other industrial countries (such as

the Federal Republic of Germany) it has been a general slowdown in industrial activity which has had a more severe impact on tin consumption. These two factors combine to reveal market changes in the uses for tin (Table 5). New markets based on the chemical properties of tin have emerged and have become steadily more significant. Thus, we find the use of tin in paints, plastics and fertilizers becoming increasingly significant.

Further, there is evidence to suggest that the high price of tin during the 1970s contributed to the decline in intensity-of-use for tin by encouraging material substitution [Castro, 1988]. This also provides for the possibility that the fall in price since 1985 might help reverse this process and encourage tin consumption.

Table 5: Consumption of Tin by Use (Selected Countries)

<u>Use</u>	<u>1976(%)</u>	<u>1986(%)</u>
Tinplate	39.0	28.1
Tinning	3.9	4.5
Solder	24.9	30.1
White Metal, Babbitt & Anti-friction Metal	8.6	6.3
Bronze and Brass	7.0	6.7
Other	16.6	24.3

Note: includes USA, Japan, France, West Germany, Italy and UK.

Source: International Tin Council, Tin Statistics 1976-1986, p.31, London, 1987.

In this review of the structure of the industry it is appropriate to address the issue of strategic stockpiles and their impact on market behaviour. Tin has always been included in the strategic stockpiles of industrial countries. It has an importance through its contribution to industrial output but its strategic significance is emphasized through the concentration of

tin production in developing countries. However, as the industrial importance of tin has declined, industrial countries have reappraised the need for strategic stockpiles and this has involved the commercial disposal of excess stocks. These disposals of strategic stockpiles has had obvious implications for the buffer stock policy of the International Tin Council. Indeed, Smith and Schink [1976] suggested that the US General Services Administration (GSA) stockpile, rather than the buffer stock, had been the main force stabilizing the tin market from 1960 to 1975 and GSA disposals have continued to be important up to and including the present time.

The significance of disposals from the GSA stockpile can be gauged from the scale of the policy. Disposals consisted of 183,706 tonnes from the commencement of sales in 1962 to the end of 1989 [UNCTAD, 1990]; a figure in excess of one year's global production.

#### THE INTERNATIONAL TIN AGREEMENTS

The First International Tin Agreement came into force in 1956 and successive agreements remained in force until 24th October 1985 when the Sixth International Tin Agreement collapsed leaving debts of over £300 million. The purpose of this section is to review the economic mechanisms employed by the International Tin Council to intervene in the operation of the tin market and to assess their impact on market behaviour.

At the heart of the agreements is a buffer stock mechanism which aims to maintain the market price of tin within a predetermined range. This price range can be considered to have



three parts: an upper range within which the authorities can sell from the buffer stock (and must sell at the ceiling); a lower range within which the authorities may buy for the buffer stock (and must buy at the floor); and a middle range where the authorities may not intervene but leave the market free to determine price. The origins of the agreements lay in the experience of the producer government sponsored international tin agreements of the inter-war years but, following the Havana Charter of 1948, it was determined that consumer governments should also be made full members of post-war international commodity agreements.

This was accommodated in the case of tin by the establishment of separate membership for consumer and producer governments, each of whom would have 1,000 votes distributed within each group according to market share. However consumer government were unwilling to contribute to the cost of a buffer stock and so separate administrative and buffer stock accounts were established with all member governments sharing the administrative costs of the agreements but the buffer stock costs being borne by the producer governments alone. This meant that the initial buffer stock was fixed at the equivalent of 20,000 tonnes of tin, with producer governments free to contribute their subscription in either cash or metal.

From the start, producer representation was more complete than that of consumers with around 90 per cent of the world production of tin-in-concentrates being produced in member states while only about 50 per cent of tin consumption was accounted for by members [Rogers, 1969]. The politics of the operation and

negotiation of subsequent tin agreements has been aimed at retaining producers as members while persuading more consumer countries to join. In practice the agreements have failed to recruit Brazil (as the major new producer) to membership and it has proved even more difficult to persuade all major consumers to join, notably the United States. Although the United States did join the Fifth International Tin Agreement, membership did not continue to the Sixth (and final) Agreement.

The buffer stock has been the central economic instrument available to the authorities seeking price stability but its effectiveness is governed by its size relative to the range of price stability being sought. The narrower the price range, the greater the resources needed to enforce it. From the outset the limited size of the buffer stock (at 20,000 tonnes) proved inconsistent with the aspirations of the Agreement's producer members. There was much debate as to whether contributions from consumers would be effective in increasing the size of the buffer stock and it was not until the Fourth Agreement that provision for voluntary contributions from consumers were included and even then only France and the Netherlands were prepared to provide such contributions.

Faced with this dilemma of inadequate buffer stock resources, the governments of producer countries realized that they could only enforce the floor price through the combination of buffer stock purchases and export controls. However, the principle of buffer stock operation is that purchases of metal made to support a floor price are available for sale at the ceiling in order to

maintain the ceiling price. If the mean price has been properly identified then buffer stock operations take place symmetrically, with purchases at the floor and sales at the ceiling.

The consequence of reinforcing buffer stock purchases with export controls is that this symmetry is lost because the buffer stock authorities will have purchased insufficient tin at the floor and so will not have enough metal for sale at the ceiling to enforce the ceiling price. Producers, whose main concern is an adequate floor price regard the use of export controls as a reasonable means of assuring a satisfactory minimum price, while consumers believe that the consequent unenforcibility of the ceiling price is a sufficient justification for their scepticism over the arrangements. The use (and alleged over-reliance) of export controls has been a major source of disagreement between the parties. The consequence was that prior to 1985 the floor price was breached on only two brief occasions, while the ceiling price was more frequently exceeded [Gilbert, 1987].

A second, and more serious problem, arises from adjustments in the price range. Consider first the case where, for fundamental economic reasons, the market price is rising over the long term. In these circumstances the authorities should be seeking to raise the price range upwards so as to keep the mean price in the buffer stock price range close to the market price. Suppose the authorities are slow to spot the upward trend and so are slow to adjust the price range upwards. In this case, the market price will move towards the ceiling price, the buffer stock authorities will sell tin until their stocks are exhausted and they hold only cash (on deposit in the major money markets)

and price breaks through the ceiling with the market price prevailing.

In the case where the market price trend is downwards, the situation is different. If the authorities are slow to judge the price trend and slow to move the price range downwards then they will be engaged in efforts to maintain the floor. Once they have used all their resources to acquire the maximum amount of tin, the only further policy open to them is export controls. However, when they now move the price range belatedly downwards to reestablish the relationship between the mean buffer stock price range and the market price, they are still in a situation where they are holding the maximum size of buffer stock metal. Therefore, they can only enforce the floor price through export controls.

Thus, if the authorities misjudge a rising price trend and are slow to react, the effect on the market price is slight and the consequences for the buffer stock authorities are limited. In contrast, when they misjudge a falling long term price trend and are slow to react the consequences are severe because they end in a situation where the authorities hold only tin and (depending on the extent of the initial misjudgement) they may incur financial losses in disposing of these holdings. Second, it tends to make the authorities over-reliant on export controls, which is likely to be resented by consumers. Third, the symmetry of price control is lost in that over-reliance on export controls means that too little is bought at low prices with the consequence that the authorities own too little to be able to control the ceiling

price effectively.

In the early years of the Agreements, the first of these scenarios prevailed. The general trend in price was upwards and the authorities were slow to react to an increase in the price trend with the result that the market price frequently exceeded the ceiling price of the agreement. Since this involved the authorities acquiring tin at a much lower price than they were able to sell it, these early agreements were also financially profitable for the members.

In later years when market fundamentals changed and the underlying price trend was downwards, problems arose in the operation of the agreements which were subsequently to lead to the financial insolvency of the buffer stock. We will examine these in more detail.

#### THE OPERATION OF THE BUFFER STOCK

Serious problems arose for the buffer stock authorities during the Fifth International Tin Agreement towards the end of the 1970's. The fundamental imbalance between production and consumption caused the authorities increasing difficulties as they attempted to maintain the price of tin. Indeed, in the six years between 1978 and 1983 the production of tin metal exceeded consumption by some 110,000 tonnes, despite export controls being in force. These problems were already well established in the market when the Sixth International Tin Agreement came into force in 1982. In its Report to the House of Commons Select Committee, the UK Department of Trade and Industry stated, "The Sixth Agreement thus came into force in conditions of a surplus of

production over consumption, a price considerably higher than it would have been in the free market and inadequate resources on the part of the International Tin Council to deal with the problem" [House of Commons, 1986a].

The issue for the buffer stock authorities was how best to use its limited resources to reduce the amount of tin coming onto the market and so maintain the price of tin. At this time the maintenance of price was dominated other objectives of the tin agreements. These objectives were expressed much more widely and include the prevention of excessive price fluctuations, the prevention of excessive imbalances between supply and demand, an increase in tin export earnings, the securing of adequate supplies for the consumer, and a dynamic and rising rate of production.

In practice, the authorities had more limited and more pragmatic goals. Export controls were intended to maintain the balance between production and consumption while buffer stock operations were used to keep the accumulated stocks from entering the market and further depressing prices [Anderson and Gilbert, 1988].

At the end of the Fifth Agreement the Buffer Stock stood at 49,385 tonnes of tin, half of which was liquidated according to the rules of the Fifth Agreement and the remainder transferred to the Sixth Agreement. Provision was made in the Sixth Agreement for a buffer stock of some 30,000 tonnes with an additional 20,000 tonnes to be financed by member states, including consumer countries. However, the failure of Bolivia, the United States and the Eastern Block countries to join the Agreement modified the

arithmetic such that the maximum amount of tin which could be controlled by the Buffer Stock Manager was 62,823 tonnes. The reality was that the Sixth Agreement came into force with a large amount of tin but little cash.

It was already apparent that straightforward purchases of tin for cash would be insufficient to defend the floor price and the Buffer Stock Manager therefore utilized a variety of operations designed to keep tin off the market and so maintain the price. One important development was "pyramiding" which involved borrowing cash from banks against the collateral of tin held in the buffer stock. Banks were prepared to lend 70 to 75 per cent of the value of the tin held as collateral and the cash so raised could be used to purchase more tin. This "new" tin was unsecured and so could be used as collateral against further borrowing. A technique which substantially increased the financial resources of the authorities.

In addition to cash sales and purchases in the spot market, the Buffer Stock Manager engaged in forward deals which increased his short-term liquidity. In particular, he made use of unpriced forward sales which had the effect of reducing the Tin Council's net commitment to tin while at the same time deferring the selling effect on the market. The problem with forward transactions, however, was that forward purchases added to the International Tin Council's holdings in the same way as cash purchases and were subject to the same aggregate total as defined in the Agreement. In an effort to deal with this problem the Buffer Stock Manager engaged in "special lends" and "special borrows". Under a "special borrow" a dealer would buy cash and

sell forward on behalf of the International Tin Council. The tin would be removed from the market but the dealer remained the owner of the tin and so the holding would not appear as part of the official buffer stock holding and so would not be subject to the limit prescribed in the Agreement. The Tin Council would pay only interest and commission on the deal.

As noted by Anderson and Gilbert [1988] the development of these techniques was subject to a number of constraints: (1) the overall size of the buffer stock permitted under the rules of the Sixth Agreement (62823 tonnes); (2) borrowings were restricted by the availability of unsecured stock as collateral; and (3) there was a liquidity constraint through the need to meet interest payments and other expenses.

Anderson and Gilbert [1988] set out clearly how the trading strategy pursued by the Buffer Stock Manager in combination with the events of the early 1980's impacted on the income of the International Tin Council such that on the 24th October 1985 the tin support operation collapsed with debts in excess of £300 million.

#### MARKET DEVELOPMENTS SINCE 1985

The protracted negotiations over the Sixth International Tin Agreement led to the formation of the Association of Tin-Producing Countries (ATPC) in 1982. The objectives of the ATPC are to strive towards stable and equitable market conditions for the tin mining industry and to enhance the demand for tin through research and development into tin consumption. The membership of the ATPC includes all major producers other than Brazil, who



nevertheless enjoys observer status at ATPC meetings.

Although the fundamental demand and supply situation had been brought into balance by 1982, the collapse of the International Tin Agreements in 1985 not only caused a spectacular collapse in price but also released onto the market the stock overhang that the Buffer Stock Manager had been seeking to manage. The collapse in prices was truly spectacular. Tin had been trading at £8330 per tonne on October 23rd 1985 and within weeks of the collapse of the Agreement the price had fallen to £6000 per tonne and it was subsequently to fall to under £4000 per tonne.

Thus, in 1987 the ATPC agreed a supply rationalization scheme which aimed to reintroduce order into the market and provide the necessary foundation for a subsequent increase in prices. Further market rationalization was to be provided through the impact of the price collapse on high cost producers and the consequent structural adjustment in market share. In particular, many mines in Bolivia were forced out of production while, in contrast, output from Brazil rose spectacularly. Although only an observer meetings, Brazil agreed to abide by export quotas.

A consequence was that in the three years from 1986 to 1988 consumption of primary tin metal exceeded the production of primary tin metal by some 45,000 tonnes in total which did much to remove the stock overhang. However, by 1989 a small but steady growth in consumption had restored a fundamental equilibrium between production and consumption. As Table 2 showed there was a radical reallocation of production between the major producing countries.

Although there was a modest increase in consumption recorded,

the overall impact was slight and has had little impact on the level of price. Indeed, with a buoyant industrial economy over the period, the growth in tin consumption was still sluggish in comparison with other metals. There is little evidence to date that the substantially lower price has done much to stimulate new customers for tin metal.

The strategy of restraining production appeared to have the desired impact on prices when, after hitting a low in the third quarter of 1986, prices recovered steadily to the end of 1988 before rising sharply to a new high in the second quarter of 1989. They then fell back sharply to the levels prevailing at the end of 1987 before seeming to stabilize at cash prices around US\$6200 on the London Metal Exchange through the first half of 1990.

The price surge in 1989 did much to undo the effects of the ATPC's supply rationalization scheme by encouraging production and causing an increase in stocks. Indeed, total tin stocks increased from 33,200 tonnes to 43,200 tonnes during the Third Supply Rationalization Period which ended on February 28, 1990 [Metal Bulletin 1990]. A major problem with the enforcement of quotas has been the need to curb smuggling, especially from Brazil. More generally, many of the problems in agreeing a programme for reduced consumption arise from the profitability of some producers, mainly in Brazil, Malaysia and Thailand, even at relatively low price levels. In many cases (especially gravel pump mining) the shut-down and start-up costs are low, making the producers very price sensitive. In other cases such as in

Bolivia and Indonesia, governments are anxious to keep mines open even at very low prices to provide employment and earn foreign exchange. Thus, supply rationalization by the ATPC is encountering many of the same problems met earlier by the Tin Council.

**Table 5: London Metal Exchange Price of High Grade Tin**  
(£ 1976-1986, US\$ since 1989)

<u>Date</u>	<u>Cash</u>	<u>Forward</u>
1976	4261.4	4367.7
1977	6208.0	6214.1
1978	6710.4	6624.3
1979	7287.1	7100.6
1980	7226.6	7241.7
1981	7086.1	7170.3
1982	7301.2	7250.2
1983	8600.8	8637.8
1984	9212.3	9218.6
1985	9481.0	9442.9
1986	Trading suspended	
1987	Trading suspended	
1988	Trading suspended	
29 December 1989	6935.0	7055.0
31 May 1990	6385.0	6505.0

**Notes:** Prices are average prices for the period 1976-85. In 1985 the average is calculated to October 23rd. Trading was suspended on October 24 1985 to 1 June 1989 when a new dollar contract was introduced. For 1989 and 1990 the forward quotation refers to 3 months. Trading in Kuala Lumpur had also been suspended on 24 October 1985 but was resumed on 3 February 1986.

**Sources:** International Tin Council, 1987; UNCTAD, 1990; and Financial Times, 1 June 1990.

#### PUBLIC POLICY IMPLICATIONS

We can identify three kinds of lessons from this experience of the operation and ultimate collapse of the international tin agreements. First, the problems that arise from the operation of an international commodity agreement in which the objectives are in fundamental conflict. Second, the extent to which the problems that have arisen are the consequence of operating in a market

where the long-term price trend has been falling. Finally, the difficulty in identifying the responsibility for the failure of the international agreements and the consequence of that failure for the conduct of public policy in an international arena.

The First International Tin Agreement was influenced by the principles contained in the Havana Charter and had four objectives contained in Article I of the Agreement which were:

"(a) To prevent or alleviate widespread unemployment or under-employment and other serious difficulties which are likely to result from maladjustments between the supply of and the demand for tin;

(b) To prevent excessive fluctuations in the price of tin and to achieve a reasonable degree of stability of price on a basis which will secure long-term equilibrium between supply and demand;

(c) To ensure adequate supplies of tin at reasonable prices at all times; and

(d) To provide a framework for the consideration and development of measures to promote the progressively more economic production of tin while protecting tin deposits from unnecessary waste of premature abandonment."

The political and economic reality of the early Tin Agreements was that they operated against a background of rising prices and where only producers contributed to the financing of the buffer stock. Thus, control over the operation of the economic functions of the Agreement was vested in the governments of producing countries.

The emphasis on the interest of producers is reflected in additions to the objectives of subsequent agreements. The political background to the later agreements is that they were negotiated under the auspices of the United Nations Conference on Trade and Development (UNCTAD) and reflect the broader political objectives of that organization. Thus, in Article I of the Fourth Agreement we find:

"(c) To make arrangements which will help to increase the export earnings from tin, especially those of the developing producing countries, thereby helping to provide such countries with resources for accelerated economic growth and social development, while at the same time taking into account the interests of consumers in importing countries;

(d) To ensure conditions which will help to achieve a dynamic and rising rate of production of tin on the basis of a remunerative return to producers, which will help to secure an adequate supply at prices fair to consumers and to provide a long-term equilibrium between production and consumption;

(e) To prevent widespread unemployment or under-employment and other serious difficulties which may result from maladjustments between the supply of and demand for tin."

This change in emphasis within the objectives of the agreements reflects not only the balance of power and interests of the members but also the general political climate and attitude towards international commodity agreements. The Fourth Agreement which was negotiated in 1970 was already reflecting the broader role attributed to international commodity agreements with respect to economic development and the social obligations

of government with respect to international trade which were to underpin the Integrated Programme for Commodities to be negotiated within UNCTAD later in the decade.

Thus, the succession of International Tin Agreements place an increasing emphasis on price raising and increasing export earnings yet the measures and resources available to the authorities are appropriate to the more modest objective of price stabilization. This is matched in operational terms through an increased emphasis on and use of export controls which, in the longer term, creates difficulties in the operation of a buffer stock to secure price stability. When the United States was a consumer member, during the Fifth Agreement, a considerable importance was attached to securing the removal of export controls both to encourage the downward underlying trend in prices and also new investment in mining. The conflict between price maintenance and price stability increased during the life-time of the agreements as social and political objectives became confused with economic objectives.

Early in the life of the Agreements these problems assumed less importance because the fundamental price trend was upwards and the inherent conflict was disguised. When market fundamentals changed, however, a number of forces conspired to bring about the collapse of the agreements. Despite the accumulated consequences of the imbalance between production and consumption, Anderson and Gilbert [1988] suggest that the floor price of the Sixth Agreement might have been maintained had the dollar continued to

appreciate against sterling.

That the Tin Agreements survived so long in the face of unfavourable market forces was in large part due to the resourcefulness of the Buffer Stock Manager in developing and exploiting new techniques to keep substantial stocks of tin from the market despite his limited financial resources. The eventual collapse of the International Tin Agreement, however, raises important questions about the responsibility for public policy when there is a failure of an international organization. Clearly responsibility can be shared between the officers of the Agreement, the member governments and any regulatory authority. With the collapse of the International Tin Council the Government of the United Kingdom (along with other governments) did not accept any legal responsibility for the debts of the Tin Council nor did it accept that it failed to act as a responsible regulator. [House of Commons, 1986b]. This issue of responsibility is an important one which in 1990 was still the subject of legal proceedings through the Courts.

Attention has focused on the role of the Buffer Stock Manager and the way in which he kept the International Tin Council and member governments informed. The only information that the International Tin Council made available with respect to its buffer stock operations were released quarterly and in arrears. These statistics, however, related only to its own holdings and so did not include the "special borrows" and so were misleading with respect to the obligations of the Council. It remains unclear how well informed the Council itself was although it is believed that the Buffer Stock Manager had warned the Council of

the need to increase the contributions to the buffer stock and also of the consequences were such enhanced contributions not forthcoming.

The extent to which governments were fully apprised of the situation through their representation on the Council is also problematic. Such were the technical nature of the operations of the Buffer Stock Manager that it is possible that representatives of member governments on the International Tin Council failed to understand both the extent of the true buffer stock holdings and also the consequences that might flow from this exposure. If individual members of the Council had failed to fully comprehend the true situation then they would be in no position to inform adequately their member governments. Nevertheless, the issue has raised questions about the legal protection afforded to the Council and its member governments in relation to both international and United Kingdom law.

The secretive nature of commodity markets and especially the opportunities provided by futures markets for the preservation of the anonymity of traders meant that the many banks and dealers associated with the activities of the Buffer Stock Manager were also unaware of the true nature and extent of the buffer stock activities. The Bank of England did receive periodic reports on overall activity in the market and so may have been in a better position than individual banks and dealers to assess the true position but the confidentiality provisions of the International Tin Agreement created difficulties even for the Bank of England in determining the implications of the buffer stock activity.



The Department of Trade and Industry was the department of the Government of the United Kingdom represented on the International Tin Council and also the government department concerned with the regulation of commodity markets in general and the London Metal Exchange. Nevertheless, it is asserted (House of Commons, 1986) that even the Department of Trade and Industry had difficulty in obtaining information from the International Tin Council and it is not clear whether the significance of the information that was obtained was fully understood. Nevertheless, it is the case that in June 1985 the Department of Trade and Industry asked the London Metal Exchange to warn its members not to advance additional credit to the International Tin Council but that the London Metal Exchange did not act on this information.

What seems to have emerged is any clear lack of responsibility for regulating the operation of the Tin Agreement. The Buffer Stock Manager had a clearly defined responsibility to maintain the floor price as determined by Council as long as he was able. He did this by utilizing a series of trading techniques, the implications of which did not seem to be understood by the members of Council. There is some reason to believe that had the Buffer Stock Manager been less able, the International Tin Agreement would have collapsed earlier and with far fewer liabilities.

Yet if the Council were not adequately informed of his activities neither could be member governments and, critically, the United Kingdom as the primary regulatory authority. Finally, many banks and dealers believed that transactions entered into with the Council which was backed by government guarantees were

financially secure as governments would take over the obligations of the Council. We now know that these beliefs were not well founded.

It is not the purpose of this paper to trace the legal ramifications of the collapse of the Tin Agreements. Metal Bulletin [1989] contains a summary of the important developments. It is the case that when legal proceedings have been completed a review of their implications for the conduct of commodity agreements will be appropriate.

#### CONCLUSION

The International Tin Agreements provide a graphic history of an apparently successful and long-lived commodity agreement which collapsed with substantial debts incurred by public servants and yet for which governments have accepted no responsibility. The public policy implications are therefore highly significant.

The general issues which arise with respect to responsibility for the conduct of public policy in the international arena are of general relevance to many areas of public policy other than commodity agreements but they require a fuller understanding and resolution of principles of international law than are available at this time.

Of more interest are the economic issues relating to the relationship between the commodity agreement and the market. What is clear is that the attempts to distort the long run trends in the market by supporting price above its long-run equilibrium level ended in failure. The economic significance is greater than

the collapse of the commodity agreement itself since they have manifested themselves in both production and consumption considerations and as such have influenced the patterns of international trade.

Tin consumption has enjoyed virtually no growth throughout this century despite the huge increase in industrial production that has occurred. Indeed, the major problems faced by the industry could be said to arise from this long-term stagnation in demand. This is in contrast to the performance of other major metals. It would be wrong to seek an explanation for this purely in terms of price but at the same time it would be foolish to deny that the maintenance of price above its long term equilibrium level has not played some role in deterring consumption.

The dual policy of price support and export controls prevented a reallocation of production towards lower cost producers. Thus, over a long period of time high cost producers in Bolivia and elsewhere were able to stay in production despite having costs well in excess of those enjoyed in more favourable conditions. At the same time there was little incentive to undertake new investment when export controls were in force and new producers found it difficult to gain market entry. It was only after the collapse of the tin agreements that a sensible scheme of supply rationalization was introduced and production expanded from low cost mines. Thus, the international tin agreements appear to have prevented production from locating in those areas and mines with the lowest costs.

Finally, one might argue that even in terms of price

stabilisation - the primary policy objective - the tin agreements were unsuccessful since sales from strategic stockpiles and foreign exchange movements had a greater impact on price than the activities of the Tin Council.

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