Evasion of Excise Duties in India: Study of Copper

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Preface

A study of the quantification of evasion of excise duty in respect of selected commodities was entrusted to the Institute by the Central Board of Excise and Customs, Ministry of Finance, Government of India. The commodities selected for this purpose are copper and copper alloys, plastics, textiles, domestic electrical appliances and wireless receiving sets including TV sets. The present report on the evasion of excise duty on copper and copper alloys is the first of a series of reports which the Institute would be submitting to the Board.

The study was entrusted to us in response to a suggestion made by the Estimates Committee (1978-79, 6th Lok Sabha) for working out at least a rough yardstick or method for estimating the extent of excise duty evasion. The study has been carried out by Dr. D.K. Srivastava, Senior Economist at the Institute. Shri P. D. Kapoor, Assistant Collector of Central Excise, who was deputed by the Board to work on this project in this Institute has been of great assistance in the study.

A. Bagchi
Director

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Shri P.D. Kapoor has been working with us on secondment from the Directorate of Inspection and Audit, Customs and Central Excise. His knowledge of Central Excise Tariff, Rules and Laws has constantly been taxed by us along with his patience. Without his active help in various ways, it would have been difficult to bring this study to fruition. To him, we express our first and foremost thanks. We are also thankful to Shri S.A. Prabhu who, in a brief period of association with this study as a consultant, shared with us not only his thoughts and ideas but also the hazards of copper mines and its approach rounds. With them, as also with Dr. N. Sinha, our colleague who is presently on the scent of evasion in plastics, such blue and grey moments were shared as are attendant upon the pursuit of evasive objectives in uncharted seas.

Dr. R.J. Chelliah and Dr. A. Bagchi have meticulously gone through the entire manuscript and made valuable suggestions both stylistic and of substance. Their help is sincerely acknowledged.

Thanks are also due to Shri A. K. Bandhopadhyay, Member (CX); Shri J.P. Kaushik, Director (CX); Shri R.K. Chakravarty, Deputy Secretary (TRU); Shri S.R. Narayanan, Director (Statistics and Intelligence); Shri S.K. Kohli, Director (Anti-Evasion); and Shri R.C. Gupta (TRU) for their help and guidance at various stages. We are also thankful to various Collectors of Central Excise who have cared to reply to our questionnaire, and along with them, to other officers of the Department whom we consulted time and again.

Our understanding of the industry has been patiently deepened by various people and organisations. In particular, we would like to mention Shri U. Mitra, Shri H.V. Saptarishy and Shri T. Datta of Hindustan Copper Ltd., along wtih Shri L. C. Mittal, their legal consultant, whose help has been

especially valuable in terms of materials and thoughts. He helped us negotiate many tricky corners of this study with skill and with generosity. Shri H.K. Raina of the MMTC also provided us with useful data.

Various manufacturers of copper semis and dealers of scrap have patiently helped us understand their practices and processes and their reactions to the existing tariff. We would like to particularly acknowledge the help of Shri M. K. Rao, Shri N.S. Surana and Shri S.R. Agarwal.

Tne Indian Copper Information Centre, Calcutta, did a small study for us regarding the consumption of primary copper in the manufacture of copper flats. Their help is gratefully acknowledged.

Computing assistance by Shri K.K. Atri and Shri A.K. Halen and research assistance, for a limited period, by Shri S. Gopalakrishnan is also gratefully acknowledged. Shri R.S. Tyagi has provided us with the typed version of the manuscript through its various drafts. We are very thankful to him.

While the help of all of these people has been indispensable, I undertake, albeit reluctantly, the responsibility of any errors that may yet remain. Given the particularly slippery bends of the present study, one would only wish that there were a way to pass off even some of the errors as due to them.

D.K. SRIVASTAVA

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Introduction

COPPER, a metallic element of atomic number 29, a "dyad" with symbol Cu to the chemist, is known along with its alloys, as item 26-A of the Central Excise Tariff and heading 74 of the Customs Tariff to trade, industry and taxmen in India. For the industrial user, its specific gravity of 8.96, its melting point at 1093°C or its boiling point at 2325°C may be of relevance, but the common man takes a fancy to the tenacity of the metal and the peculiar hue of its distinctive red colour.

The word copper derives from the Latin word "cuprum", meaning the "metal of Cyprus", so named after its most noted ancient source. It should not be surprising, therefore, that imports account for a substantial share of our current use of primary copper although now-a-days these imports emanate mainly from what are known as the CIPEC countries, *viz.*, Chile, Peru, Zaire and Zambia. These are the most notable copper-exporting sources in modern times. During the period from 1971-72 to 1979-80, we have met 74.6 per cent of our requirement of primary copper by imports.

Nevertheless, copper mining and manufacturing activity is quite old and ancient in India. According to local belief, copper was mined in Khetri area during the Mauryan period (300 B.C.). Frequent mention of this metal is found in *Yajur Veda* and *Atharva-Veda* (1000 B.C.). In *Manu Samhita*, directions for the purification of copper are given. The metal is

mentioned in many places in Kautilya's *Artha Shastra* (3rd Century B.C.).

Domestic production of primary copper in India is now-a-days handled by just one concern, *viz.*, Hindustan Copper Ltd. The Minerals and Metals Trading Corporation of India Ltd. acts as the canalising agency for imports of copper.

Copper contributes about Rs 18 crore in the form of excise tax revenue. In the period from 1968-69 to 1978-79 it has grown at a compound growth rate of 16.85 per cent per annum. The magnitude of revenue from copper in terms of import duty and countervailing duty is substantially higher, accounting to about Rs 150 crore annually.

For the year 1978-79, the contribution due to the domestic production of primary metal, mostly in the form of cathodes and wire-bars, was 46.6 per cent of the excise tax revenue from copper products. The contribution of secondary rerollers basically producing sheets, circles and strips was 32.4 per cent and the contribution from the manufacture of pipes and tubes was 20.5 per cent.

Industrial Uses of Copper

Copper is malleable, ductile and tenacious. It is a very good conductor of electricity and heat and as such it is at the heart of the electrical industry. It is used for electrical wiring, switches, plumbing, heating, roofing materials, chemical and pharmaceutical machinery, electro-plating, fungicides, and cooking and decorative utensils and articles. A considerable proportion of copper is used in the form of alloys, where it is used with such other metals as zinc, tin, aluminium and lead. As far as the Central Excise Tariff is concerned, according to the current definition, all such alloys where copper predominates by weight are to be considered as copper for purposes of inclusion under tariff item 26-A.

The family of copper alloys along with the proportions of other relevant metals is detailed on the facing page.

For the industry as a whole, the main alloys used are the various brasses and bronzes. Yellow brasses are used for making snap fasteners, musical instruments, automobiles'

TABLE 1.1

Copper Alloys

Mix (Per cent)

Name	Copper +
Yellow brasses	Zinc 30 – 40
Red brasses	Zinc 15
Lead brasses	Zinc 30—40 Lead 0.25 – 3
Special brasses	Zinc + other alloying elements
Commercial bronze	Zinc 10
Leaded bronze	Zinc 10 Lead 1—4
Phosphor bronze	Tin 1.25—10.5
Tobin bronze	Zinc 0.39 Tin 0.75
Aluminium bronze	Aluminium 5 – 9.5
Hitenso cadmium bronze	Cadmium 0.8—1
Cupro nickel	Nickel 5—30
Nickel silvers	Zinc 17—21 Nickel 5—30
Leaded nickel silvers	Zinc 17—21 Nickel 5 – 30 Lead 1 – 2.75
Everdur	Silicon 1.5—3 Manganese 0.25—1
Gun metal and bell metal	Zinc 3 Tin 10
German silver	Zinc 20 Nickel 20

Source : Hindustan Copper Ltd.

reflectors and lamps, artillery and cartridge cases, electrical sockets, lamp bases, pins, etc. Red brasses are used for water pipes, auto-radiators, drawn, stamped and spun parts, oil refineries, vanity cases, chemical processing and air-conditioning equipment. Commercial bronze is used for costume jewellery, grills, ammunition components, forgings, screws, rivets, hardware and stampings. Phosphor bronze is used for high

strength springs, snap switches, fuse clips, diaphragms, screw plates, bearings and hardwares. Aluminium bronze is used for aircraft engine parts, valve seats and guides, propeller hub cases, and spark plug inserts.

Copper itself, i.e., of 99.5 to 99.9 per cent purity, is used for electrical wires, cables, water pipes and tubes, refrigerator tubes, gaskets, convector heaters, engravers' plates, roofing material, flushing and gutters. Wherever electrical uses are involved, electrolytically refined copper is used; for other uses, fire-refined copper is acceptable.

Due to its higher specific gravity in relation to aluminium, copper turns out to be a relatively heavier metal although it is a better conductor of electricity and heat. Due to a lower weight and a lower cost for comparable uses, a large-scale substitution of aluminium for copper has taken place world-wide. In India, once domestically produced aluminium became available in large quantities and on economic terms, aluminium has replaced copper in many electrical uses. Again, a similar substitution has taken place in regard to copper utensils. Apart from aluminium, steel is also being used extensively for making utensils. It has a better finish even though it is costlier. Due to these reasons, consumption of primary copper in the country declined sharply between 1965 and 1970, but it has picked up again since 1971 due to general industrial growth.

Structure of Copper Industry in India

The supply of copper in India is made from three sources: production of primary or virgin metal from copper ore; supply of secondary metal or scrap arising out of production processes and life-time recycling of the metal; and imports, both of virgin metal and scrap.

After the metal is released from the primary producer or imported or obtained through recycling, it would be used either as copper or as copper-base alloy. In the latter case, other alloying materials will be added. At this stage, the metal will be in the form of solids like wire-bars, bars, billets, slabs, etc. Subsequently, copper and its alloys will go through one or more of the following processes, *viz.*, forging,

rolling, casting, extrusion and drawing. From wire-bars, wire-rods are rolled which are then drawn into wires and cables. Strips are cut from sheets or they are sometimes made from wires. In India, presently plates and foils are not generally made due to a lack of suitable facilities. In making pipes and tubes, first blanks or shells are extruded from billets and subsequently drawn into pipes and tubes.

The structure of the industry is detailed below:

a. Production of primary or virgin copper. Production of primary copper from ore has been nationalised and now there is only one producer of primary copper in India, *viz.*, Hindustan Copper Ltd. The company presently looks after copper complexes, deposits and projects at Ghatshila and Rakha in Bihar; Khetri, Dariba and Chandmari in Rajasthan; and Malanjkhand in Madhya Pradesh. While most projects are in a developmental stage, the two main complexes where the metal is currently being produced are Ghatshila (Bihar) and Khetri (Rajasthan).

In modern copper complexes such as Khetri Copper Complex (KCC) at Khetri and Integrated Copper Complex (ICC) at Ghatshila, copper ore is converted into metal, broadly speaking, through the following steps.

Ore is mined by blasting, crushed within the mine to small pieces, transported to factory (through conveyor belts), crushed further to fine dust and passed through froth-flotation cells, thickeners and filters. A lot of waste called tailing sand is removed in this process and the remaining material has a higher concentration of metal.

This higher grade material is roasted/fused leading to the formation of copper mattee which has 40 to 50 per cent of copper (Cu). This mattee is processed through smelters and converters producing blister copper containing 96-98 per cent Cu which is then cast into shapes called anodes. This is fire-refined copper. For making brass, or for other uses where fire-refined copper is acceptable, anodes may be directly used. For electrical uses, anodes are passed through an electrolytic refining process producing cathodes (99.5 per cent Cu) which are then melted and cast into wire-bars by using wire-bar moulds.

From the original copper ore, which is of a low grade in India, only a very small percentage is recoverable in the form of metal. There are various other byproducts recovered from the ore like sulphuric acid, nickel sulphate, gold and silver. The percentage of metal recovered from the type of ore found in Rajasthan and Bihar may be gauged from the following data.

TABLE 1.2

Recovery of Copper from Ore

(Tonnes)

Year	Ore milled	Blister copper	Column (3) as percentage of column (2)
(1)	(2)	(3)	(4)
1973—74	11,16,850	12,899	1.15
1974—75	14,28,224	15,801	1.11
1975—76	19,97,065	23,888	1.20
1976—77	23,71,282	23,715	1.00
1977—78	23,43,818	21,021	0.90
1978—79	22 32,108	21,888	0.98

Source : Hindustan Copper Ltd, Annual Reports.

The Working Group on Non-Ferrous Metals (1980) makes the following observation in this context:

> "The grade of the deposits is generally low, varying from 0.9 to 2.0% in the working mines, bulk of the deposits being below 1.5% Cu."

The low recovery ratio of copper from copper-ore in India, implies a heavy cost-structure as compared to production costs in other countries where copper is not considered worth producing from ore if the recovery ratio is anything less than 5 to 6 per cent.

b. *Manufacture of alloys*. The main alloys used in India are brasses and bronzes. Brass is made by the primary manufacturer at Ghatshila by mixing virgin copper, with virgin zinc and process scrap generated within the factory. The ratios may be varied according to the requirements of the end-users, but mostly the ratio is 60 copper to 40 zinc. In

general, however, alloys are made by the secondary manufacturers.

These people generally combine :

(i) Virgin copper + Virgin zinc or other alloying material.

(ii) Virgin copper + scrap of copper or copper-base alloys + Virgin zinc or other alloying material.

(iii) Scrap of copper or copper-base alloys + Virgin zinc or other alloying material.

Zinc scrap by itself would rarely be used. Alloys are generally cast first in the form of solids like bars, billets, slabs, etc.

c. *Manufacture of wires, winding wires and cables.* Wires are drawn from wire-rods which are hot-rolled or extruded from wire-bars. Wires are cold-drawn from wire-rods. This old technology is now being replaced in most advanced countries by continuous casting methods where wire-rods are directly cast from cathodes thus bypassing the wire-bar stage. This technology is on the threshold of being introduced in India on a substantial scale. Further and further drawing produces wires of smaller and smaller diameters, i.e., higher and higher gauges.

d. *Manufacture of flats.* Flat products, *viz.*, plates, sheets, circles, strips and foils are classified as "semis". These are produced both in the organised sector and the non-organised sector. In the latter, only sheets and circles are made while in the former normally sheets, strips and foils are made.

In the organised sector, generally, primary metal, either in the form of virgin metal or in the form of pre-alloyed ingots in the case of alloys, are melted in electrical furnaces or oil-fired furnaces. About 60 per cent of process scrap is also charged along with the primary metal. The molten metal is cast in a metallic mould to obtain the hot-rolling stock, *viz.*, billet which is heated to a higher temperature for hot rolling. For reduction in thickness, these are further cold-rolled, having been annealed and pickled wherever necessary. At various stages, the flats are checked and unsuitable products are rejected as scrap and recycled. For producing thin gauge pro-

ducts like foils with very close dimensional tolerances, Z-mills are preferred. Recently, organised sector units have started using semi-continuous and continuous casting techniques for producing flat products.

Units in the non-organised sector use oil-fired furnaces for melting the raw material which consists partially of virgin copper and alloying material like zinc for alloys, but mainly of old and process scrap. In come cases, ingots are made first for the sake of control on the chemical composition of the product. Casting is carried out in metal moulds. This is followed by hot rolling of billets and one or more rounds of cold-rollings punctuated by annealing and pickling at appropriate stages.

Some quanties of plates and sheets, and invariably the entire lot of strips and foils, are used for engineering applications. Such flat products undergo one or more rounds of further fabrications including slitting, blanking, bending, forming, soldering and finishing. Physical and mechanical characteristics of the flat products stipulated by specifications vary depending on the end use.

Plates, sheets and circles are used for non-industrial applications including manufacture of utensils, artwares and other decorative wares, involving cruder methods of bending, forming, soldering-brazing and finishing by a variety of techniques.

Circles are basically used in the utensil making industry. This sector also makes use of sheets. The copper utensil industry is one of the oldest in India. The concentration of the utensil-making industry is in places like Jagadhari, Rewari Hathras, Moradabad and Bombay. These manufacturers, mostly in the small-scale sector, make their own billets, and send these to "job-rollers" and get back circles and process scrap in return. Many a time small circles are cut from larger circles to meet specific requirements. For industrial uses, among the flats, mostly sheets and strips are used.

Sheets and circles may be cleared in a trimmed or an untrimmed condition. In the process of rolling, the edges on all sides do not remain uniform in thickness and have irregular or non-uniform ends and these have to be trimmed out

before a sheet or a circle could be used for further manufacture. In the case of job-rollers, mostly untrimmed circles and sheets are sent back to the utensil manufacturers; or else, edges are sheared off, and scrap arising from these trimmings plus the trimmed sheets and circles are sent back to the utensil manufacturers who have cast and supplied the billets. Shearing charges in themselves are very nominal.

Strips are basically used in various user industries and are manufactured by medium to large-scale producers.

e. *Manufacture of hollows, viz., pipes, tubes, shells and blanks.* Pipes and tubes are made of copper as well as its alloys. They are generally seamless but they can be with a seam also.

In making pipes and tubes, first, billets are made of copper or the necessary alloy from wire-bars, process scrap generated within factory, or other pedigree scrap. Billets are then cut into smaller pieces and shells are extruded. In the process of extrusion, hot metal is forced through a suitable die by means of a ram. Shells are washed in a pickling tank, and one end is tapered, after which they are put through cold-drawings on draw benches. The operation of drawing is one of pulling while that of extrusion is that of pushing; further, in extrusion, the metal is hot, while in drawing, generally, it is cold. In order to reduce the wall-thickness and the diameter of the tube, it may have to be put through several draws, and it is generally subjected to annealing between draws for softening the metal.

The main types of tubes being manufactured in the country are (i) copper tubes for refrigeration industry, (ii) copper tube coils, (iii) heat exchanger tubes in copper and copper base alloys, (iv) admiralty and aluminium brass condenser tubes, (v) 90/10 cupro-nickel tubes, (vi) 70/30 alloy brass tubes for sugar mills, (vii) phosphor de-oxidised copper tubes and arsenical copper tubes for railways and general engineering industries and (viii) brass tubes for stove pressure lamp industry[1], agricultural sprayers, ball bearings and

[1] Sometimes these are made by drilling holes in rods at both ends. Then these belong to item 68 rather than item 26A.

other general engineering industries.

As the industry is organised at the moment, there are a few large-scale factories in the organised sector, producing pipes and tubes in an integrated process. Apart from these, there are a few extruders, who extrude shells out of billets which are then taken by small-scale producers who draw pipes and tubes from the shells and blanks.

Mostly virgin copper imported by MMTC is used for making pipes and tubes. Lately, the refrigeration industry has started accepting tubes made of imported copper scrap also and the refrigeration market is being captured by the small-scale people using scrap of copper.

f. *Industry-wise pattern of consumption.* The average percentage shares of consumption of primary copper by different industries for the period 1976-78 have been estimated in the *Report of the Working Group on Non-Ferrous Metals (1980)* as follows :

Industry	**Consumption (per cent)**
Winding wire	36.0
Electrical goods/motors/switch-gears/ transformers	6.0
Cables and wires	14.0
Automobiles and auto-ancillaries	3.5
Semis and alloys	18.0
Mint, ordnance factories and railways	11.9
Others	10.6
	100.00

Thus the highest percentage is in the electrical industry (36+6+14=56). Semis and alloys account for an appreciable part, *viz.*, 18 per cent of this total.

It should be remarked that, 1963 onwards, a large-scale substitution of copper by aluminium took place for use in overhead transmission lines.

Tariff Structure for Copper

First, we consider the tariff structure as it prevailed in 1978-79 which is our period of reference for purposes of

comparison of an estimated potential tax base with the actual tax base in order to quantify evasion. We then consider the present tariff structure with a view to subsequently examining those aspects of it that have a bearing on evasion and avoidance.

a. *Statutory and effective rates.* Item 26-A, as it was in force, prior to 1.3. 1980 referred to

"Copper and copper alloys containing *not less than fifty per cent by weight* of copper".

This item was divided into four categories, *viz.*,

(1) In any crude form including ingots, bars, blocks, slabs, billets, shots and pellets;

(1a) Wire-bars, wire-rods, and castings, not otherwise specified;

(2) Manufactures, the following, namely:
Plates, sheets, circles, strips and foils in any form or size;

(3) Pipes and tubes.

Item 26-A was revised on 18.6.1980. Thenceforth it referred only to *copper*, the phrase "copper alloys ... fifty per cent by weight" having been dropped and the following explanation having been added:

" 'Copper' shall include *any alloy* in which copper predominates by weight over each of the other metals."

The division of the item into four categories stood as before.

Item 26-A was further revised on 1.3.1981. The item has been divided into six categories since then. The changes introduced at this time referred to the following:

(i) introduction of two new sub-items under 26-A, *viz.*,
"1b) Waste and scrap; and
4) Shells and blanks, for pipes and tubes".

Sub-item 3 was rewritten as

"3) Pipes and tubes, excluding shells and blanks, therefor". An Additional explanation was added saying

"(Explanation-II)

'Waste and Scrap' means waste and scrap of copper fit only for the recovery of metal or for use in the manufacture of chemicals, but does not include slag, dross, scalings, ash and other cuprous residues".

The statutory and effective rates for various sub-items under 26-A are detailed below. These rates were applicable in 1978-79 and they are also applicable to date.

TABLE 1.3

Statutory and Effective Rates of Duty*

Item	Unit	Statutory rate for basic duty	Effective rate for basic duty
1	M.T.	Rs 5600	Rs 3000
1a	M.T.	Rs 5600	Rs 3000
1b**	M.T.	Rs 5600	Rs 3000
2	M.T.	Rs 6300	Rs 3700
3	ad.v.	28%	28%
4**	ad.v.	28%	28%

* Compiled from Central Excise Tariffs and Relevant Notifications.

** Applicable since 1.3.1981.

In addition to the basic duty, a special excise duty at the rate of 10 per cent of the basic duty is applicable now. This rate was 5 per cent in the year 1978-79.

b. *Notifications and their revenue importance.* The revenue potential of any Central excise item depends on the effective rates and exemptions defined in the relevant notifications which the Central government is empowered to issue under various provisions of the Central Excises and Salt Act, 1944 and Central Excise Rules, 1944, especially under Rule 8 (1) of the said Rules.

Below we shall outline the nature of notifications relating to this item and their relative importance in terms of revenue.

First, let us take up the exemption clauses that have only a minor importance in terms of revenue. These relate to the use of strips and foils for imitation Zari, (Notifn. 117/61, and strips and foils made from scrap of copper alloys that are intended for the manufacture of trinkets (Notifn. 118/61).

Anode moulds, wire-bar moulds, mould plates and starter sheet blanks falling under this item are exempt from the whole of the duty if intended for use by the primary producers in the factory in which such anode moulds, etc., had been

manufactured provided that these are subsequently melted in the same factory (Notifn. 236/75).

A concessional rate of duty (*viz.*, Rs 420/- per MT) is applicable for copper ingots, if these are intended for use in the manufacture of fungicides (Notifn. 181/66 as amended by Notifn. 113/77). Plates, sheets, circles, strips, foils, pipes and tubes of copper in any form or size, if manufactured in a Central government ordnance factory, are exempt from the whole of the duty (Notifn. 11/76). Strips or other manufactures of copper and copper alloys manufactured out of bare copper wires on which duty has already been paid under item 338 (ii), (Electric wires and cables NOS) are exempt from so much of duty of excise as is equivalent to the duty already paid (Notifn. 60/65).

The revenue importance of these notifications is minimal. Out of a total clearance of 1,12,658 tonnes in 1978-79, clearances under the above notifications accounted for almost negligible shares, as would be evident from Table 1.4.

TABLE 1.4
Clearances Under Specified Notifications (1978-79)

Notification	Clearance (Tonne)
117/61	—
118/61	—
236/75	25
142/76	—
181/66	—
11/76	149
60/65	15
TOTAL	189
TOTAL CLEARANCE	112658

Source: Directorate of Statistics and Intelligenee, Central Excise and Customs, *Statistical Year Book, 1978-79*, New Delhi.

Where the tax rate is nil, the clearance and production would not, of course, be reported in general, as in these cases the manufacturing units are not required to take a licence from the Central Excise Department under rule 174-A vide

Notifn. No. 31/76. This notification exempts "fully exempted copper and copper alloys" from licensing control. But, since there is no duty involved, the revenue impact is going to be nil in any case.

For purposes of calculations of duty incidence and the extent of evasion, these notifications can in general be ignored.

The substantive content of important notifications from the viewpoint of revenue is outlined below:

(i) Plates, sheets, circles, strips and foils under sub-item (2) in the manufacture of which copper falling under sub-item (1) or (1a) made out of 'old scrap of copper or copper alloys' or scrap obtained from duty-paid virgin metal is used, are exempt from so much of duty as is in excess of Rs 700/- per metric tonne (MT).
Subsequently, the expression under single quotes (*ours*) above has been changed to 'old scrap of copper waste'. (Notifn. 54/62 *et al*)

(ii) Plates, sheets, circles, strips and foils falling under sub-item (2), in the manufacture of which copper alloys in any form is used and on the virgin copper or the copper content of the alloy the prescribed amount of excise duties have been paid, or are deemed to have been paid, are exempt from so much of duty as is in excess of Rs 700 per (MT). (Notifn. 74/65 *et al*).

(iii) Sheets and circles of copper (i.e., two of the items mentioned above), if produced by a manufacturer on a *rolling mill* and issued therefrom in an untrimmed condition, are exempt from so much of the duty of excise leviable thereon as is in excess of Rs 600/- per MT provided that the sheets and circles as above are made from old scrap, or duty-paid virgin metal or duty-paid scrap from virgin metal and duty-paid waste and scrap. In other cases, the duty is Rs 3400 per MT (Notifn. 31/65 *et al*).

(iv) Pipes and tubes, if made from duty-paid metal in crude form or manufactures thereof, are entitled to an exemption equal to the amount of duty already paid (Notifn. 213/63 *et al.*)

(v) Copper and copper alloys in any crude form falling under sub-item (1) or (1a) are exempt from the whole of duty provided that these are made from old scrap of copper, scrap arising from duty-paid copper, duty-paid virgin copper, copper purchased from the market after August 20, 1966, and duty-paid waste and scrap of copper or combinations thereof. This has been covered under Notifn. 119/66 along with its subsequent modifications. Since the interpretation of this notification has led to some controversies recently, the full text of the notification as it now stands, is reproduced below.

"Copper in any crude form including ingots, bars, blocks, slabs, billets, shots and pellets, falling under sub-item (1) of this Item and wire-bars, wire rods and castings of copper falling under sub-item (1a) and waste and scrap of copper falling under sub-item (1b) of the said Item are exempt from the whole of the duty of excise leviable thereon, if made from any of the following materials or a combination thereof, namely:

(i) Old scrap of copper; or

(ii) Waste or scrap obtained from copper or copper alloys where the prescribed amount of duty of excise, or, as the case may be, the additional duty leviable under Section 2A of the Indian Tariff Act, 1934 (32 of 1934), has been paid on the copper or the copper content of alloys; or

(iii) Virgin copper in any crude form on which the prescribed amount of duty of excise, or, as the case may be, the additional duty leviable under Section 2A of the Indian Tariff Act, 1934 (32 of 1934), has already been paid; or

(iv) Copper in any crude form purchased from the market on or after the 20th day of August, 1966; or

(v) Waste or scrap of copper and copper alloys, falling under sub-item (1b) of the said Item No. 26-A, in respect of which the appropriate amount of duty of excise or, as the case may be, the additional duty leviable under Section 3 of the Customs Tariff Act, 1975 (51 of 1975), has already been paid on the copper or the copper content of the alloys.

2. This notification shall be deemed to have taken effect from 24th day of April, 1962.
3. The clause (iv) shall be deemed to have been inserted w.e.f. 20.8.1966.
4. The word inserted vide Notifn. No. 59/68-CE., dated 23.3.1968, shall be deemed always to have been inserted.

Vide Notification No. 119/66/CE., dated 16.7.1966 read with subsequent amendments".

The two main effective rates of duty relate to sub-items (1) and (1a) and item (2). The effective rates are Rs 3700 per MT for (2). These have been defined in Notifin. 113/78 and Notifn. 114/78, respectively.

The effective rate of duty for pipes and tubes is the same as the statutory rate, *viz.*, 28 per cent. There is a provision, however, for set-off of duty-paid on copper at the crude stage.

A summary of the five notifications referred to above along with two others is given below. These are the important notifications from the viewpoint of revenue.

Notifications[2]		*Subject*[3]
(i)	54/62	Effective rate of duty for sub-item (2), *viz.*, plates. sheets, etc., issued in a trimmed condition, if made from process scrap arising from duty-paid metal or old scrap.
(ii)	74/65	Effective rate of duty for plates, foils, strips, trimmed sheets and circles in the manufacture of which duty-paid virgin copper has been used.
(iii)	31/65	Effective rate of duty for sheets and circles under sub-item (2) if issued in an untrimmed condition and produced on a rolling mill

[2] Notification number refers to the original notifications and should be read with subsequent modifications, if any.

[3] What is detailed below indicates the general intent of the notifications. For all the necessary conditions, the full text of the notification will need to be consulted.

(iv) 213/63 Set-off for duty-paid copper used in the manufacture of pipes and tubes.

(v) 113/78 Effective rate of duty for sub-item (1) and (1a) if made from copper on which duty has not been paid at any earlier stage.

(vi) 114/78 Effective rate of duty for sub-item (2) if made from copper on which duty has not been paid at any earlier stage.

(vii) 119/66 Effective rate of duty (*viz.*, zero) for copper under item (1) and (1a) made from old scrap or duty-paid virgin copper or copper purchased from the market after a specified date.

The relative importance of these notifications in terms of their percentage contribution in the total revenue raised, and in terms of their percentage shares in total clearances, can be gauged from Tables 1.5 and 1.6.

TABLE 1.5

Percentage Contribution of Important Notifications in Total Excise Tax Revenue for Copper

Year	Notifications							Total
	54/62	74/65	31/65	213/63	113/78	114/78	119/66	
1970-71	11.73	30.77	8.29	5.73	27.93	14.93	—	99.38
1971-72	11.38	23.97	6.72	6.70	19.73	11.95	—	80.45
1972-73	7.52	15.38	4.18	4.88	17.15	0.13	—	49.24
1973-74	7.08	15.54	3.77	5.71	19.11	5.09	—	56.30
1974-75	4.94	9.30	2.68	10.18	29.40	0.16	—	56.66
1975-76	3.78	7.26	2.26	9.77	34.53	0.04	—	57.64
1976-77	3.87	6.29	1.95	0.69	51.83	—	—	64.63
1977-78	6.50	9.77	3.17	9.54	63.98		—	92.96
1978-79	10.83	15.45	4.54	17.49	44.72	—	—	93.03

Note: No contribution from Notifn. No. 119/66 since effective rate of duty is zero.

Source: Directorate of Statistics and Intelligence, Central Excise and Customs. *Statistical Year Book, 1978-79*, New Delhi.

TABLE 1.6

Percentage Share of Important Notifications in Total Clearances

Year	Notifications							
	54/62	74/65	31/55	213/63	113/78	114/78	199/66	Total
1970-71	15.71	40.77	12.92	2.89	11.93	4.97	10.10	99.29
1971-72	16.95	35.56	12.72	3.62	10.41	4.18	6.17	89.61
1972-73	18.76	39.15	12.28	4.79	14.26	0.11	10.53	99.88
1973-74	16.12	32.55	11.21	3.53	15.10	3.09	17.47	99.88
1974-75	16.83	32.46	10.57	4.16	15.23	0.47	19.31	99.03
1975-76	14.16	27.62	10.05	3.39	16.18	0.17	28.50	100.07
1976-77	14.02	22.09	8.36	2.39	27.17	—	24.95	99.79
1977-78	16.10	24.39	8.86	2.23	26.42	—	21.94	99.94
1978-79	17.57	25.06	8.57	2.22	19.63	—	26.55	99.06

Source: Directorate of Statistics and Intelligence, Central Excise and Customs. *Statistical Year Books, 1970-71 to 1978-79*, New Delhi

It would appear that the effective rates of duty for copper at different stages of production have the following main constituents:

Copper "in any crude form" and wire-bars, wire-rods and casting NOS	Rs 3.000 per tonne
Manufactures (sheets, circles, etc.) from duty-paid copper or old scrap	Rs 700 per tonne
Manufactures (sheets and circles in an untrimmed condition) from duty-paid copper or old scrap	Rs 600 per tonne
Manufactures (sheets, circles, etc., from copper on which no duty has been paid at any earlier stage)	Rs 3,700 per tonne
Manufactures (sheets, circles in an untrimmed condition) from copper on which duty has not been paid	Rs 3,400 per tonne
Pipes and tubes	28 per cent *ad valorem* (less duty paid on copper at the crude or semi-manufacture stage)

Subsequent to the modifications in the tariff on 1.3.1981, the following effective rates need to be mentioned.	
Waste and scrap arising from duty-paid metal, or recycled within the factory of use	Nil
Waste and scrap (Otherwise)	Rs 3,000 per tonne
Shells and blanks for pipes and tubes	28 per cent *ad valorem*

c. *Collectorate-wise pattern of revenue.* Collectorate-wise revenue, percentage contribution and growth in revenue from copper are summarised in Table 1.7.

TABLE 1.7

Collectorate-Wise Generation Revenue from Copper

Selected collectorates*	Revenue in 1978-79		Compound growth rate (per cent per annum) between 1968-69 and 1978-79
	Amount (Rs '000)	As per cent of total	
Ahmedabad	1574	1.23	4.23
Allahabad	3948	3.09	5.21
Baroda	1391	1.09	(—)2.90
Bombay	27521	21.51	1.61
Calcutta	1076	0.08	4.28
Chandigarh	8439	6.60	8.77
Delhi	2525	1.97	**
Indore	1712	1.34	***
Jaipur	39179	30.62	@
Madras	1337	1.05	1.62
Mysore	1813	1.44	16.43
Patna	33709	26.35	14.69
Pune	1438	1.12	2.77

* Collectorates showing more than Rs 10 lakh as revenue in 1978-79.

** Shows a very sudden jump in 1978-79; previous level of revenue always less than Rs 1 lakh.

*** Only two observations are available.

@ Between 1974-75 and 1978-79.

Source: Directorate of Statistics and Intelligence, Central Excise and Customs. *Statistical Year Book, 1978-79*, New Delhi.

It is clear that only three collectorates out of twenty-five account for the bulk of the revenue obtained from copper. In 1978-79, these collectorates, *viz.*, Bombay, Jaipur and Patna, accounted for 78.5 per cent of the total excise duty revenue from copper whereas Jaipur and Patna collectorates cover the Khetri and Ghatshila units of the primary manufacturer of copper, *viz.*, Hindustan Copper Ltd., for Bombay, most of the revenues are derived from the duty on flats, pipes and tubes. Other collectorates showing potential for revenue, judging from the growth rates, are Chandigarh, Calcutta, Mysore and Allahabad.

d. *Item-wise pattern of revenue.* The three main types of items generating revenue are (i) "copper in any crude form" and wire bars; (ii) flats, *viz.*, plates, sheets, circles, strips and foils and (iii) pipes and tubes. Clearances for these items and their contribution to revenue are summarised in Tables 1.8 and 1.9, respectively, for the period 1970-71 to 1978-79. In interpreting the revenue figures, it should be noted that the bulk of the revenue for flats is based on the partial duty (Rs 700 or 600 per tonne in recent years) and the bulk of the revenue from pipes and tubes is based on the difference between the *ad valorem* duty (28 per cent in recent years) minus the set-off of duty paid on copper in any crude form (Rs 3,000 per tonne in recent years).

It would be observed that the relative contribution from the manufacture of primary copper has increased considerably, and that from flats has gone down substantially. In absolute terms, pipes and tubes are contributing a persistently increasing amount of revenue. This is primarily due to increases in their prices, the tax rate being *ad valorem*. It will be noted that the quantities cleared under this head do not show a corresponding increase.

Imports: Structure of Imports and Import Tariff

More than 65 per cent of our current requirements of primary copper are met by imports. Imports are required to meet shorfalls, both in the quantity and the quality, of domestically produced copper. In particular, imported copper

TABLE 1.8

Item-Wise Clearances in Copper

(Tonnes)

Year	Copper in any crude form	Flats	Pipes and tubes
1970-71	8172	50924	3847
1971-72	7825	52189	3668
1972-73	9072	44709	3075
1973-74	10792	45569	2571
1974-75	9896	39204	3177
1975-76	13031	41757	3781
1976-77	17904	48602	2949
1977-78*	26899	53238	2447
1978-79	20781	57700	2734

* Excludes clearances under the simplified procedure for some years as also those under some minor notifications.

Source: Directorate of Statistics and Intelligence, Central Excise and Customs. *Statistical Year Book*, 1970-71 to 1978-79 Editions, New Delhi.

TABLE 1.9

Item-Wise Revenue* From Copper

Year	Revenue* from						
	Copper in any crude form and wire bars		Flats		Pipes & tubes		Total
	Amount (Rs'000)	As per cent of total	Amount (Rs'000)	As per cent of total	Amount (Rs'000)	As per cent of total***	Basic duty (Rs'009)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1970-71	12257	27.3	29490	65.7	3093	6.9	44860
1971-72	11037	24.4	30226	66.8	3932	8.7	45240
1972-73	13609	29.8	21606	47.4	3887	8.7	45593
1973-74**	15520	30.3	26232	51.2	4675	9.5	51210
1974-75	32216	51.3	18718	29.8	11172	17.8	62835
1975-76	52129	59.6	20158	23.1	14817	16.9	87448

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1976-77	98607	71.1	23550	17.0	14137	10.2	138773
1977-78	111526	68.2	34055	20.8	16880	10.3	163474
1978-79	56679	46.6	39455	32.4	24984	20.5	121749

* Refers to basic duty of excise.
** Includes auxiliary duty of excise.
*** Percentages do not always add to 100 as minor amounts of revenue under some notifications as also revenue under the simplified procedure for some years have been left out.
Source: Directorate of Statistics and Intelligence, Central Excise and Customs. *Statistical Year Books*, 1970-71 to 1978-79 Editions, New Delhi.

is needed for winding wires of high gauges as the domestically produced wire-bar is not soft enough for the purpose.

But apart from the needed quality in certain specified uses, the demand for copper as a whole far outstrips the domestic supply leading to considerable imports, evidenced by the fact that we are now even importing copper and copper-base scrap in substantial quantities.

a. *Import canalisation.* The canalising agency for imports of copper is MMTC. In 1978-79, for the release of copper by MMTC, the following procedure was outlined:

Copper is allocated to users by the MMTC and the HCL. In this regard, the *Handbook of Import-Export Procedures* specifies precise details. In recent years, the following arrangements were specified for the allocation of copper according to para 148a of the *Handbook*.

"(a) In the case of copper, eligible Actual Users (industrial) register their requirements with the canalising agency (MMTC) and the indigenous producer, M/s Hindustan Copper Ltd., as under:

MMTC	Hindustan Copper Ltd.
(i) Manufacturers of winding wires, commutators and switchboard cables/wires.	(i) All government departments.
(ii) Bharat Heavy Electricals Ltd.	(ii) All Central/State

	public enterprises, other than those under MMTC.
(iii) Hindustan Cables Ltd.	(iii) Manufacturers of semis, alloys and auto ancillaries.
(iv) Manufacturers of switch-gear and transformers.	(iv) Any other users.
(v) New Government Electric Factory, Bangalore.	
(vi) Manufacturers of Cables wires and Conductors.	

(b) Actual users eligible to secure the material as above, from the MMTC/Hindustan Copper Ltd. may register their requirements to the extent of their certified consumpion in 1978-79, 1979-80 or 1980-81, whichever is higher. However, this should not enable them to exceed 125 per cent of their licensed/registered capacity.

(c) New units or existing Actual Users as are in need of additional quantities may apply to the MMTC or Hindustan Copper Ltd., as per the above division of categories only after their demands are sponsored by the concerned sponsoring authorities."

b. *Magnitude and structure of imports.* Data for imports of copper and copper alloys are given in Table 1.10.

TABLE 1.10

Imports of Copper and Copper Alloys

(Tonnes)

Year	Copper and alloys refined or not unwrought	Copper and alloys worked	Copper waste scrap	Waste scrap of brass, bronze and other alloys	Others*	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1970-71	46543	5244	—	—	—	47067
1971-72	50711	5462	—	—	—	56173

(1)	(2)	(3)	(4)	(5)	(6)	(7)
1972-73	50265	4191	—	—	—	54456
1973-74	49189	3433	—	—	—	52621
1974-75	39466	2300	—	—	—	41774
1975-76	11318	3492	463	2377	—	17650
1976-77	29703	1996	2478	5312	—	39489
1977-78	32609	4076	6358	11760	128	54931
1978-79	69706	5767	9886	12378	136	97873

*Includes nails, tacks, bolts, nuts, screws, and articles of copper and its alloys.

Source: Director-General of Commercial Intelligence, *Monthly Statistics of the Foreign Trade of India, Vol. II-Imports, Calcutta.*

It would be clear that the bulk of imports are those of "Copper and alloys refined or not unwrought". Wire bars fall under this category, and most of the imports are in this form. Once importation of copper scrap and copper-base scrap has been allowed, it is clear that substantial quantities of scrap have been imported.

TABLE 1.11

Total Consumption and Imports of Copper

Year	Consumption (tonnes)	3-Yearly moving average of col. (2)	Imports (tonnes)	3-Yearly moving average of col. (4)	Share of imports in consumption (per cent)	Column (5) as per cent of col. (3)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1971-72	64,000		56,200		87.3	
1972-73	57,200	60,300	54,500	54,433	95.3	90.3
1973-74	59,300	41,433	52,600	49,633	88.7	96.5
1974-75	37,800	48,200	41,800	36,700	110.6*	76.1
1975-76	47,500	46,670	15,700	32,700	33.1	70.1
1976-77	54,700	54,400	40,600	26,367	74.2	48.5
1977-78	61,000	67,900	22,800	47,500	37.4	70.0
1978-79	88,000	73,670	79,100	47,700	89.9	64.8
1979-80	72,000		41,200		57.2	
TOTAL	5,41,900		4,04,500		74.6	

*Indicates higher imports can be carried over for consumption in subsequent years.

Source: Director-General of Commercial Intelligence, *Monthly Statistics of the Foreign Trade of India, Vol. II-Imports*, Calcutta.

In Table 1.11, figures for total consumption and imports of copper (primary metal) are given highlighting the high contribution of imports in satisfying domestic demand for the virgin metal.

c. *Import tariff.* In Customs Tariff, 1975 onwards, copper has been referred to in Chapter 74.

Important features of the import tariff relating to copper are: (1) the classification of the item, and (ii) definition of alloys.

According to the notes contained in Section XV on "Base Metals and Articles of Base Metal", subject to other qualifications, an alloy of base metals is to be classified as an alloy of the metal which predominates by weight over each of the other metals.

It should be pointed out that the classification of copper under Chapter 74 of the Customs Tariff and the classification of copper under item 26-A of the Excise Tariff are considerably different, the former being based on the BTN classification and the latter on the older League of Nations classification.

Table 1.12 presents the statutory and effective rates for different items of copper under the Customs Tariff.

TABLE 1.12

Customs Tariff: Statutory and Effective Rates for Copper (As on 1.7.1980)

Heading No.	Description of article	Statutory rate (per cent)	Effective rate* (per cent)
74.01/02	Copper mattee		
	Unwrought copper	100	40
	(refined or not)	100	70
	Copper waste and scrap	100	80
	Master alloys	100	40
74.03	Wrought bars, rods, angles, shapes and sections.		
	(1) Not elsewhere specified	100	60
	(2) Bars, rods, angles, shapes, sections and wire of unalloyed copper'	100	60

74.06	Copper powders and flakes	100	100
74.07/08	Tubes and pipes and blanks therefor of copper; hollow bars of copper; tube and pipe fittings (for example, joints, elbows, sockets and flanges), of copper;		
	(1) Not elsewhere specified	100	60
	(2) Tubes and pipes and blanks therefor, and hollow bars, of nominal bore exceeding 19 millimetres	40	40
74.09/19	Other articles of copper including nails, tacks, staples, hooknails, spiked cramps, studs, spikes and drawing pins of iron or steel with heads of copper.	100	100

Note: For oxygen-free, high-conductivity copper wire, bars, rods, angles, shapes and sections, plates, sheets, strips, tubes and pipes the effective rate is 45 per cent.

* Subject to other notifications contained in Chapter 74 of the Customs Tariff

Source: *Customs Tariff* read with relevant notifications.

The Role of Secondary Metal or Scrap

Although the quantification of the extent of evasion has been attempted in Chapter 2 it will be seen that the determination of the supply of secondary metal is of crucial importance to that exercise. As a prologue to the estimation of evasion, and as a vital feature of the copper industry, we propose to discuss at length the supply and the role of scrap of copper and copper-base alloys in India.

Both because India has a limited supply of primary metal and because scrap of copper and copper-base alloys is readily reusable and can be substituted for virgin metal in most non-electrical uses, the recovery and recycling of scrap of copper and its alloys assume considerable significance for the copper industry in India.

Three types of scrap of copper or copper-base alloys can be distinguished:

a. New scrap or process scrap	This arises from current fabrication and manufacturing operations.
b. Old scrap or life-cycle scrap or scrap due to obsolescence	This arises when articles which are fully or partially made of copper, run out of their useful life or are rendered obsolete or otherwise discarded.
c. Ashes and residues	These arise largely from pyrometallurgical foundry and metal-finishing operations.

The Central excise tariff, after the introduction of item 1b, *viz.*, "waste and scrap", has defined it as :

> "Waste and scrap of copper fit only for the recovery of metal or for use in the *manufacture* of chemicals, but does not include slug, dross, scalings, ash and other cuprous residues".

Process scrap is generally recycled back into the same process. Old scrap is very important in terms of augmenting the supply of primary metal available in the country. In many instances, it is the first choice of a manufacturer for production of semi-manufactures or chemicals. Copper-base scrap may be used for making copper alloys that are melted to meet stringent specifications, as also for castings that may be used under rigorous operating conditions.

Pedigree scrap, i.e., scrap whose antecedents are known or in other words, whose admixture of metal is known, is preferred to other types. It is also possible to test the admixture of metals chemically. However, this is feasible or economic only when a large amount of similar type of scrap is being recycled.

Different scrap grades are interchangeable to some extent between different user industries. Generally, the purity or the copper content of scrap will predetermine the uses which the remelted metal will be put to. Scrap arising from articles using electrolytically refined copper having a purity of 99.95 per cent like wires and cables may have a purity of 97.98 per

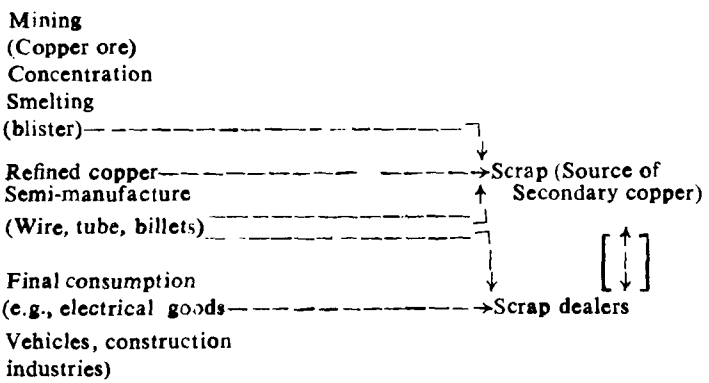
cent plus when it is recycled and may still be used for electrical purposes. In other cases, where the copper content is lower, alloys like brasses and bronzes are made by adding zinc or other alloying material and even some virgin copper.

There is a well-developed, well organised and very old scrap market in India. Scrap dealers purchase scrap from street hawkers who might have procured scrap from manufacturing units using copper at an earlier stage, i.e., semi-manufactures or crude forms. This kind of scrap will generally be "process scrap". Hawkers also collect scrap from households and other collection points for old industrial scrap. Scrap dealers also purchase scrap directly from the factories. There are well-established channels for marketing stolen copper mostly in the form of wires and cables.

In order to place the generation and supply of scrap in its proper perspective in the process of manufacture of copper, the following figure may be helpful :

FIGURE 1.1

The Technical Process of the Manufacture of Copper



Source: World Copper Prospects, London: Bankers Trust Company 1973) p. 27.

a. *Generation of process scrap.* Process recycling or current recycling of copper scrap, as opposed to life-time recycling, arises from the fact that, in order to produce final articles of copper, the metal has to be put through various stages of manufacture and at each stage some scrap is likely to arise due to shearing, cutting, trimmings, dead ends, rejection of pieces for defects or unacceptable standards or proportions in the case of alloys.

Process scrap arises from the use of primary metal as well as secondary metal once these are subjected to manufacturing processes. In tracing different stages and types of process scraps, we can consider different categories of user industries separately.

(i) Manufactures of wire and cables

(i) a. *Winding wires.* These wires are made from wire-rods which are made from wire-bars. Wire-bars or billets cut from wire-bars are rolled into wire-rods from which wire is drawn. Scrap arising here may not be more than 10 per cent. Their first scrap can be recycled in the same use. However, the production of wire-bars needs some specialised facilities because of the need to control the amount of oxygen and sulphur. Very few units other than the primary manufacturer in India have such facilities. Scrap which is not recycled within the process is sold.

(i) b. *Electrical goods.* From wire-bars, bus-bars, strips and plates are made through fabrication and/or rolling. Scrap is mostly sold out and used for alloys or non-electrical uses of copper. Estimated process scrap in this category is 10-15 per cent.

(i) c. *Cables and wires.* These are drawn from wire-rods which are rolled from wire-bars/billets. Again, the scrap may not be more than 15-20 per cent which essentially represents burnt-out pieces.

(i) d. *Auto and auto-ancillaries.* In automobiles, about 30 to 40 kg of copper and brass per vehicle, more for heavier vehicles, is used, comprising electrical wires, cables, bearings, and rediators. In some of the uses copper has been slowly replaced by aluminium. Scrap generated in the manufactur-

ing process may be about 25 per cent which is generally recycled within the industry.

(i) e. *Semis and alloys.* In this category, plates, sheets, circles strips and foils as also pipes and tubes made of copper as well as its alloys will fall. In India plates and foils are not generally manufactured, the former being too thick and the latter too thin, for available rolling facilities. Among flats, the main production is that of sheets, circles and strips.

Circles are rolled generally by small manufacturers who do it either as job-rollers, using billets rolled by utensil manufacturers or they themselves make their billets. Circles are generally used by utensil manufacturers or handicraft industries. Apart from some metal recoverable from the billet moulds scrap is generated when non-uniform edges are trimmed or smaller circles are cut out of larger circles. There are also some rejects and broken circles. More scrap arises when mechanical processes are used in making utensils in the shape of trimmings, dead ends, etc. Hand-made utensils also leave similar scrap, although it is less in quantity.

Sheets are made in integrated factories making their own billets as also by small job rollers. In integrated factories, after hot rolling, sheets are checked first for visible smelting defects. Sheets are then cold rolled and at each stage sorting is done, and rejects add to the scrap. In the end, trimming is done to make sheets of uniform and smooth edges and of the required width and length. The production of strips too follows similar steps. It is estimated that in every cycle, 45-50 per cent of process scrap is generated in the making of sheets, circles and strips. The proportion is somewhat less for integrated plants as compared to small-scale manufacturers.

b. *Generation of old scrap.* Copper and its alloys, except when they are used as chemicals, periodically keep coming back into circulation. When the useful life of the article in which these may have been used fully or partically comes to an end, copper and its alloys contained in these articles are recovered and reused. Knowledge about the pedigree of the scrap and the composition of the alloys would determine the uses to which it would be put. In electrical uses, the finest kind of copper in terms of purity and softness is used, while

in the manufacture of utensils and copper and brass handicrafts even highly impure copper is acceptable.

Because the copper industry in India, has ages-old history the accumulated base for the generation of old scrap is likely to be very large.

Comments on average lives and the reasons for the scrapping of various articles made from copper and its alloys are presented below :

Article	*Average life*	*Reasons for scrapping*
Winding wire used in motors, transformers, TVs, record-players, etc.	5 years	Burning, shorting, wearing out.
Electrical wires and cables	15-20 years	Shorting, replacement by aluminium wires and cables, manufacturing defects like inadequate covering with PVC, and theft.
Parts of railway engines ship's engine and boilers	15 years	Burning, overheating; wearing out.
Earthing connections, lightning conductors	20 years	Lose effectiveness; Government policy of replacement after a certain number of years for government buildings.
Parts of wine and beer tanks and sugar and molasses tanks and pipelines in sugar mills, breweries, etc.	5-7 years	Wearing out.

Utensils	20 years (Range 0-200 years	Theft, loss of taste or preference of the owner, natural end, deshaping, accidents.
Other articles like locks, taps, pen-tips, sanitary fittings material, name-plates, fancy goods, nails, tacks, etc.	10 years	Theft, wearing out.
Pipes and tubes, basically used in refrigeration, milk depots; sanitary fittings (in earlier days)	10-15 years	Wearing out, accidents.

Available Estimates of Supply of Secondary Metal

Even though the supply of scrap is very important to the user industries there are no firm quantitative indications as to the extent of its availability in India. The Working Group on Non-Ferrous Metals (1980) observes:

> ". . . Scrap statistics are notoriously susceptible to double counting and other factors which make them unreliable, even in other industrially advanced countries. So far as India is concerned, hardly any statistics is available on availability and consumption of copper and copper base scrap." (p.47.)

We have come across only very few studies where a rough indication as to the quantity of secondary metal in India has been provided even in very broad terms.

In the *Report of the Working Group on Non-Ferrous Metals* (1980), the following observations have been included:

> "No statistics of actual quantities of copper and brass scrap recycled in India is available. A rough estimate puts the figure of scrap consumption at 15 per cent of the total copper consumption in the country."

If we work on this basis, the following estimates of

secondary metal emerge from the data on the consumption of primary copper.

Suppose consumption of primary metal is P, and that of secondary metal is S. Then total consumption is P+S. And S is 15 per cent of P+S. Thus we have

$S = .15 (P+S)$

or $S = 0.1765 P$

Using data for P for five years beginning 1975-76, we get the corresponding estimates for secondary metal, as given in Table 1.13.

TABLE 1.13

Estimate Consumption of Secondary Metal (1975-76 to 1978-80)

Year	Consumption of	
	Primary metal	Secondary metal
	(1)	(2)
1975-76	45,500	8382.35
1976-77	54,700	9652.94
1977-78	61,000	10764.71
1978-79	88,000	15529.41
1979-80	72,000	12705.88

Source : Column 1, Government of India, Ministry of Steel and Mines (1980). *Report of the Working Group on Non-Ferrous Metals*, New Delhi.

The level of consumption of secondary metal calculated in this manner seems to be very considerably on the low side. A further difficulty arises in using this approach by linking secondary metal to primary metal for a current year. Secondary metal should normally be a monotonically increasing series, so far as old scrap is concerned or should reflect cycles experienced in the past consumption of copper and not so much of that in the current consumption of copper. If for any reason demand for copper goes down in a current year, domestically available scrap would still be used and it is the imports which would normally be curtailed. The estimates provided above include both the supply of process

scrap and old scrap. While the study in question has done a detailed analysis of the generation of process scrap, the estimation of old scrap appears to be rather summarily dealt with.

A second estimate is given by the Indirect Taxation Enquiry Committee (1977). They made the following observations:

> "The above consumption pattern, however, does not take into account the consumption of scrap-based copper and its manufactures produced by secondary manufacturers, which is approximately *20000* tonnes per annum."

This figure relates to the year 1976.

In estimating secondary metal, both these estimates include process scrap and old scrap. It should be borne in mind that the process scrap arising out of current manufacturing processes does not augment the supply of the metal. If we start with 100 tonnes of virgin metal, then all the process scrap having been recycled, it would provide only 100 tonnes of metal in the final products, ignoring melt losses. Thus, the recycling of process scrap only ensures the full utilisation of the original supply of virgin metal, and it should not be construed as if it increases it by any amount. It is only the old scrap which augments the supply of metal over and above the primary metal.

It is our understanding that the estimate included in the *Report of the Indirect Taxation Enquiry Committee* (1977) is based on the Central Excise Year Books. There are several difficulties in making any estimate on the basis of the data given there.

The main notifications under which data relating to scrap may be reported are Notifn. Nos. 119/66, 54/62 and 31/65. Notifn No. 119/66 deals with the manufacture of copper in the forms defined for sub-items (1) and (1a) of item 26-A of the Central Excise Tariff, *viz.*, items like slabs, billets, wirebars, bars, rods, etc., out of duty-paid virgin copper, old scrap of copper and its alloys or pre-tariff stock of copper. Until a recent clarification given by the Central Board of Excise

and Custom,[1] the effect of this notification was to exempt almost all manufacture of copper in the forms defined for sub-items (1) and (1a) by manufacturers other than Hindustan Copper Ltd. from duty. Once there is total exemption, units are not required to take licence from the Central Excise Department under Rule 174-A of Central Excise Rules, 1944. Consequently, their production is also not reported to the Department. As such, whatever data are reported under this notification in the Central Excise Year Books would only be partial because they will only cover those units who are producing some dutiable items along with the goods falling under Notifn. No. 119/66. In addition to this, there is also the problem of disaggregating the production reported under this head between that which is due to the use of (i) duty-paid virgin metal, and that which is due to process scrap, and (ii) old scrap. Unless one gets hold of this disaggregation it is not possible to estimate, using Central Excise data, the amount by which the supply of the metal is increased due to old scrap.

Notifns. 54/62 and 31/65 deal with semi-manufactures, *viz.*, plates, sheets, etc. Some of the clearance under these may relate to primary metal. Furthermore, flats by themselves would not account for all the old scrap.

It is still instructive to note the amount of production reported under these notifications for the last few years. This information is given in Table 1.14.

In our opinion both the estimates of the Working Group on Non-Ferrous Metals (1980) and the Indirect Taxation Enquiry Committee (1977) are on the low side. A fresh attempt needs to be made for determining the supply of secondary metal of copper in India. One should also distinguish between supply of process scrap and old scrap.

We start out with the following observations:

1. The supply of secondary metal in the long run is dependent on the supply of primary metal in the past. While for short periods, *viz.*, one to three months, people may hold

[1] Discussed in Chapter 3.

TABLE 1.14

Production Reported Under Specified Notifications

(Tonnes)

Year	Notifications 119/66	54/62	31/65
1970-71	6953	10821	9143
1971-72	4630	12805	10143
1972-73	6729	11984	8186
1973-74	12523	11537	8398
1974-75	12690	10910	6932
1975-76	22970	11601	8150
1976-77	31343	15387	8986
1977-78	24938	17337	9746
1978-79	31224	20162	12018

Source: Directorate of Statistics and Intelligence, Central Excise and Customs, *Statistical Year Books*, 1970-71 to 1978-79 Editions, New Delhi.

on to scrap in the expectation of a price-rise, for longer periods the cost of holding becomes prohibitive as even scrap is highly priced. The long-run supply of scrap is, however, expected to be price-inelastic.

2. This tendency is reinforced by the fact that in the International Metal Exchanges, the price of primary copper, with which the price of secondary copper is linked, does not show any noticeable trend although it shows considerable short-term variations. Indian copper prices are linked to the international prices and would show the same pattern. This means that, in the long run, price variations would not affect the supply of secondary metal.

3. Old scrap arises when the useful life of an article in which copper has been used, or which is fully made of copper or its alloys, is finished. The article is then discarded and the copper content removed for purposes of recycling. Secondary metal also arises because of substantial stealing of copper articles, especially wires and cables. There is an extensive network of dealers in copper-base scrap all over India. The price of copper is so high that most of the copper is brought

back into circulation again and again. We expect that if copper had been used in an article, a very small proportion of it would be irrecoverably lost. This may be the case with copper chemicals, salts used as fungicides, or copper-reinforcements used in the structures supporting bridges, etc.

4. Since copper is an age-old industry in India, the base of copper in the country has been increasing over the years and the level of supply of metal due to obsolescence must be high.

In order to determine the supply of secondary metal in the form of old scrap of copper and copper-base alloys in any given year, one has to consider the time-profile of the supply of metal in previous years. Total metal used in any year consists of (i) primary copper, (ii) old scrap of copper, (iii) old scrap of copper-base alloys, and (iv) other metals used in the making of alloys. Let us call these components, respectively, P, S_1, S_2, and A.

About 10 per cent of $(P + S_1)$ goes into the making of alloys, i.e., $= .1\ (P + S_1)$. The weight of this increases due to the contribution of A, i.e., due to the use of other alloying material. The implied increase in the weight of $(P + S_1)$ is about 5.5 per cent. About the same amount, however, is lost as irrecoverable for future use in the process of manufacture either as melt-losses or due to use in chemicals, etc. The total weight of the metal used in any given year, that can be recovered in future years is thus $P + S_1 + S_2$, the contribution of A cancelling out against melt-losses, use in chemicals, etc.

It is expected that all or most of this total weight of the metal would be recycled back into the economy in subsequent years. In the first year after production, a very small proportion of the metal would come back, may be due to theft, accidents, burnings; in the second year, a slightly higher proportion would come back, and so on. The largest parts would come back after a certain number of years depending on the frequency distribution of average lives of different articles made of copper and its alloys. After that the proportions of recycling would keep falling as they are further and further

distanced from the year of manufacture, tapering off to zero in the end. Thus, there is an inverted V-shape to the curve of weight that governs the recycling of the metal used up in any given years. The inverted V-shape may have to be modified for extraneous reasons like large-scale substitution of copper by some other metal. For the time being, however, we have worked on the basis of a symmetric inverted V-shape of the weight function.

In other words, suppose the articles made from copper, whether from primary or secondary metal, in any given year, have in them a quantity Z (tonnes) of copper. Out of this, suppose a proportion w_1 is recycled the next year, w_2 in the second year, until in the year n, a proportion w_n is recovered. Suppose a proportion k of Z is never recovered. Then we have,

$$w_1 + w_2 + w_3 + \ldots\ldots\ldots + w_n = (1\text{-}k)$$

A priori, we assume that w_1's are generated from a function with an inverted V-shape weights rising to a peak and then symmetrically declining.

A number of alternative functions can be used to generate these weights.

The method which we have used tentatively is to generate the weights from

$$w_1 = b.i$$

$$\text{for} \quad i = \left(1, \ldots\ldots\ldots, \frac{n+1}{2}\right)$$

$$\text{and} \quad w_1 = b.\,(n + 1 - i)$$

$$\text{for} \quad i = \left(\frac{n+3}{2}, \ldots\ldots\ldots, n\right)$$

For the sake of simplicity we have taken n to be an odd number so as to get a unique mid-point. The value of b is determined by using the relationship:

$$\sum_{i=1}^{n} w_1 = (1 - k)$$

In alternative schemes we have asssumed k = .40, .35, .30, .25 and .20 indicating that 60, 65, 70, 75 and 80 per cent,

respectively, of the metal used in any given year is recycled back in n years, the rest being irrecoverably lost for purposes of recycling. Weights have been generated for the following combinations of w_1 and n:

TABLE 1.15

Combinations of Parameters Used for Determining Weights for Estimation of Supply of Secondary Metal Due to Obsolescence

n/ Σ wi	0.60	.65	.70	.75	.80
21	√	√	√	√	√
25	√	√	√	√	√
31	√	√	√	√	√
35	√	√	√	√	√

In order to calculate the secondary metal and the total consumption of metal, we go through the following steps.

Suppose, from a historical period, we have inherited a supply of secondary metal S_0 at the beginning of the analysis, say, year, 1. Suppose total metal used in any given year i, is $Z_i = S_i + P_i$,

Where S_i is domestically procured secondary metal and P_i is non-secondary metal used in the economy including domestically produced and imported virgin metal plus imports of scrap.

Then we have

$$S_1 = w_1 S_0$$
$$S_2 = w_2 S_0 + w_1 Z_1$$
$$S_3 = w_3 S_0 + w_2 Z_1 + w_1 Z_2$$
$$S_4 = w_4 S_0 + w_3 Z_1 + w_2 Z_2 w_1 Z_3$$
$$S_5 = w_5 S_0 + w_4 Z_1 + w_3 Z_2 + w_2 Z_3 + w_1 Z_4$$

$$S_j = w_j S_0 + \sum_{i=1}^{j-1} w_{j-1} Z_i$$

(If $j > n$, $w_j = 0$)
and $Z_i = P_i + S_i$

We have data on total consumption of primary metal for 31 years, which are given in the Appendix. So we start the cycle 31 years ago with hypothetical figures for the inherited initial stock as 1000 tonnes, 2000 tonnes, 5000 tonnes and 10,000 tonnes.

TABLE 1.16

Estimates of Secondary Metal (Old scrap)

(Quantities in tonnes)

Period of recovery (years)	Initial stock			
	5000	10000	15000	20000
			$\Sigma w = .60$	
21	48323	48423	48524	48625
25	44480	44591	44703	44815
31	36939	37039	37139	37239
35	32146	32259	32373	32487
			$\Sigma w = .65$	
21	56192	56327	56462	56596
25	49383	49518	49653	49789
31	40614	40732	40849	40967
35	35229	35358	35488	35618
			$\Sigma w = .70$	
21	62608	62773	62938	63103
25	54495	54657	54818	54980
31	42392	42517	42643	42769
35	38309	38408	38506	31605
			$\Sigma w = .75$	
21	69405	69605	69805	70005
25	59821	60012	60203	60394
31	48326	48485	48643	48802
35	41593	41759	41926	42091
			$\Sigma w = .80$	
21	69951	70144	70337	70529
25	65370	65593	65817	66040
31	52333	52515	52697	52878
35	40923	41090	41257	41423

Note: Σw indicates per cent of metal recovered, $(i - \Sigma w)$ indicates per cent of metal never recovered. Thus, a value of $\Sigma w = .70$ indicates that 30 per cent of copper, once produced, would not be recycled back.

The resultant estimates of secondary metal for 1978-79 are presented in Table 1.16.

It should be noted that these estimates vary with the following parameters:

(i) initial stock;

(ii) sum of weights, incorporating information on what proportion of metal is never recovered;

(iii) average life-cycle of articles in which copper has been used.

In addition, the estimates are also dependent on the schemes of weights which we have used.

It would be observed that the estimates are not very sensitive to the initial stock levels. They are more sensitive to changes in the assumption regarding irrecoverable losses (i.e., $1-\Sigma w_1$) and the length of the period in which the metal is assumed to be recovered.

If we assume that (i) copper used in articles would be recycled back within a span of 31 to 35 years, (ii) 30 per cent of it is never recovered, and (iii) that the inherited stock of metal some 30 years ago was in the range of 5,000 to 20,000 tonnes, we come out with an estimate of about 40,000 tonnes of secondary metal from old scrap for 1978-79.

It has been indicated to us that the recovery period for copper articles for recycling is 25 years plus and that peak recoveries for any given year's supply would occur 12 to 13 years ahead of the year of supply. Similarly, expert opinions in the field indicate that apart from powders and chemicals and antiques, most other copper articles would be brought back into circulation. Given the scarcity of the metal in the country, the rate of recovery is relatively higher than in other countries and 70 per cent recovery seems to be a reasonable assumption, especially since a lot of demand for low-grade and non-electrolytic uses of copper exists in the country.

2

Estimation of Extent of Tax Evasion

In order to estimate the extent of excise tax evasion in copper, we have attempted, as a first step, the reconstruction of a hypothetical tax base that would have been available for taxation in the absence of evasion. Applying appropriate tax rates to different categories of this hypothetical tax base, potential tax revenue is estimated. The excess of the potential over the actual tax revenue is interpreted as evasion. The hypothetical tax base has been constructed, proceeding from the input side, tracing the supply of metal as obtained from primary production, imports, old scrap and marketed process scrap, and relating these inputs to taxable outputs by applying appropriate ratios and conversion factors where necessary. The advantage in using this input-side approach lies in an almost one-to-one correspondence between the weight of the input and that of the output in the context of a specific rate of duty for item 26-A for all items other than pipes and tubes (and blanks and shells, therefor). There are, however, a few snags in following this approach. For some ratios or proportions, reasonably reliable estimates are available; however, the variation may be over a wider range for some others. In order to get over this difficulty, we have attempted to estimate tax evasion by varying the values of a few parameters over a range and study the sensitivity of estimated evasion in response to variations in the values of these parameters.

The exercise relating to the estimation of the extent of evasion has been done with reference to the financial year 1978-79, as mentioned in Chapter 1.

Flow Diagram relating Inputs to Taxable Outputs

The following flow diagram would be helpful in tracing the channels relating inputs to the manufactures that are taxable under item 26-A.

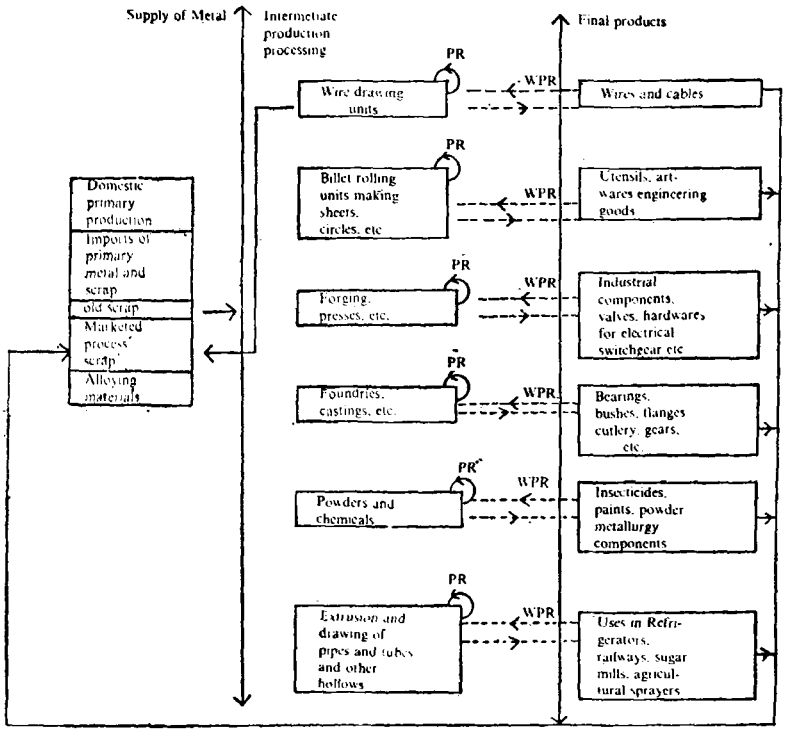
The taxable outputs with reference to the year 1978-79 are: (i) copper in any crude form; (ii) flats, *viz.*, plates, sheets, circles, strips and foils; and (iii) hollows, *viz.*, pipes and tubes. As far as copper in any crude form is concerned, only the production of the primary producer is taxable, subject to minor exceptions. This is in the form of wire-bars and cathodes. Virtually all other production of billets, slabs, ingots, etc., is exempt under Notification 119/66. The inputs for flats and hollows come from the domestic production of primary metal, old scrap, marketed process scrap, imports of virgin metal, and imports of scrap. A substantial proportion of these inputs is, however, channelled into producing outputs that are subject to taxation under other items, e.g., item 338 (electric wires and cables) or item 68 (e.g., brass wires, sections, profiles).

It is necessary, therefore, to estimate the proportion of the total supply of metal which goes into the production of flats and that which goes into the production of pipes and tubes.

Furthermore, process scrap arising in downstream activities in converting flats into final articles is recycled into the manufacture of flats. For this reason, the figure for production of sheets and circles, etc., for purposes of taxation will be higher than the figure for the ultimate consumption of metal in any given accounting period. In order to establish this cleavage, we shall distinguish between (i) the initial supply of metal consisting of virgin copper, virgin alloying materials, imported primary copper and scrap, process scrap, obtained from the market (arising from other sectors) and old scrap that goes into the flats' sector; and (ii) subsequent process recycling of the metal with reference to the down-

FIGURE II.1

Diagram Indicating the Flow of Copper and Copper-Base Alloys



Notes : WPR = Within sector process recycling with reference to downstream activities on the products of a given sector.

PR = Process recycling within the same unit or group of units of production.

Most intermediate productian/processing units cast their own ingots/billets. There are, in addition, a number of units which only cast ingot, billets, etc., and supply these to the processing units.

stream activities for converting these flats into final articles. The implication of this kind of sectoral recycling of metal *vis-a-vis* our method of estimation of the potential tax base is explained below.

Process Recycling between Semi-Manufactures and Final Goods

For purposes of illustration, suppose we start with 100 tonnes of copper in any crude form as the initial supply of metal. Suppose these are converted into trimmed sheets. After allowing for 1 per cent of melt-loss, suppose ultimately 99 tonnes of sheets are made from the crude copper. On these 99 tonnes, duty will be paid at the rate of Rs 700 per tonne assuming that the crude-stage duty liability is deemed to have been discharged.

Now, from these 99 tonnes of sheets, stamping, utensils, and other such articles are punched, cut out or otherwise fabricated. In the process, some scrap will arise. Suppose this is 20 per cent (this figure is used only for the purpose of illustration here) of the 99 tonnes of sheets, i.e., 19.8 tonnes. Suppose, all of this is taken back to produce sheets again. With a melt-loss of 1 per cent in converting scrap to the form of billets, and again a 1 per per cent loss in converting billets to sheets, 19.406 tonnes of sheets are made in the second cycle and are subjected to tax. These sheets will again give rise to 20 per cent scrap during the production of final articles. As this process is repeated, starting out with 100 tonnes of metal, tax will be levied on approximately 123 tonnes of sheets whereas in the end the total weight of final articles will be only 98.51 tonnes. The parameters in this example like the percentage of melt-loss and the proportion of generation of scrap can be varied. However, the main point which should be clear is that whereas 100 tonnes of metal is consumed, partial duty of Rs 700 is paid on a substantially higher amount, namely, 123 tonnes, with reference to the example given above. This process has been tabulated in Table 2.1 for purposes of illustration.

TABLE 2.1

Recycling between Semi-Manufactures and Final Goods*

$1=.99, b_1=.20$

Metal in crude form	Semi-manufactures (trimmed)	Final goods	Process scrap
A or $(b_1 l^2 A)$	lA	$(1-b_1)lA$	$b_1 lA$
100.000	99.000	79.200	19.800
19.602	19.406	15.525	3.881
3.842	3.804	3.043	0.761
0.753	0.746	0.597	0.149
⋮	⋮	⋮	⋮
124.381	123.137	98.510	24.627
$= \frac{A}{1-b_1 l^2}$	$= \frac{lA}{1-b_1 l^2}$	$= \frac{(1-b_1)lA}{1-b_1 l^2}$	$= \frac{b_1 lA}{1-b_1 l^2}$

Key: l=ratio of melt-loss; b_1 = Proportion of recycling

* Each column has been summed up as a geometric series having an initial term and a constant ratio. Melt-loss arises at two stages. Parameters values are hypothetical here and used for the purpose of illustration only.

Implicit Equivalence of Taxation of Trimmed and Untrimmed Circles and Sheets

Before we embark upon the exercise relating to the quantification of the extent of evasion, there is another relationship that we need to conceptually clarify. This relates to the rate differential between the effective duty on trimmed sheets and circles and that on untrimmed sheets and circles.

The effective rate of tax on plates, sheets, circles, strips, and foils is Rs 700 per tonne, whereas the tax on sheets and circles, if made on a rolling mill and issued in an untrimmed condition, is Rs 500 per tonne. It appears that this difference has been allowed for so that trimmings arising from untrimmed sheets and circles may not get taxed again and again. For purposes of illustration, we assume that melt-losses are 1 per cent in rolling billets into sheets and circles and 1 per cent in converting the trimmings into billets.

Further, suppose that the trimmings are 15 per cent of the weight of the untrimmed sheets or circles. It is shown in Table 2.2, that a manufacturer, starting with 100 tonnes of metal, can clear either 98.65 tonnes of trimmed sheets and circles at Rs 700 per tonne or 116 tonnes of untrimmed sheets and circles at Rs 600 per tonne, assuming that the sheets and circles are trimmed outside his factory and he recycles these trimmings.

It will be observed that the relationship between the tax rates on trimmed sheets and circles and untrimmed sheets and circles is implicitly governed by the formula:

$$\left(\frac{1A}{1-b_2 l^2}\right) R\,(UNT) = \left(\frac{(1-b_2)1A}{1-b_2 l^2}\right) R(T)$$

where

l = ratio of melt-loss

b_2 = ratio of trimmings to the weight of untrimmed sheets or circles.

R(UNT) = effective rate of tax for untrimmed sheets or circles

R(T) = effective rate of tax for trimmed sheets or circles

Both R(UNT) and R(T) relate to rates where the semi-manufactures arise from metal on which the crude stage duty is deemed to have been paid.

The above relationship can be reduced to

$$R(UNT) = (1 - b_2)\ R(T)$$

Thus, given R(UNT) and R(T), i.e., Rs 600 and Rs 700 per tonne, respectively, one can work out the value of b_2, i.e., the recycling coefficient implicit in the rate differential which comes out to be 14.28 per cent. Alternatively, given the value of b_2 and R(T), one can work out the value of R(UNT), thus providing the corresponding rate differential. It has been pointed out to us that the appropriate value of b_2 is nearer 25 per cent rather than 15 per cent as implicit in the current rate differential of Rs 100 per tonne.

This implies that the existing rate differential does not fully correct for the recycling of trimmings. We have recommended subsequently for a marginal increase in the differential. For the purpose of the present exercise, we have used

TABLE 2.2

Explanation of Rate Differential between Trimmed and Untrimmed Circles and Sheets

$l = .99, b_2 = .15$

Metal in crude form	Sheets and circles untrimmed	Sheets and circles trimmed	Process scrap (trimmings)
A or (b_2l^2A)	lA	$lA(1-b_2)$	b_2lA
100.000	99.000	84.150	14.850
14.702	14.554	12.371	2.183
2.161	2.140	1.819	0.321
,	,	,	,
,	,	,	,
,	,	,	,
117.235	116.063	98.654	17.409
$= A/(1-b_2l^2)$	$= lA/(1-b_2l^2)$	$= (1-b_2)lA/(1-b_2l^2)$	$= b_2lA/(1-bl^2)$

Key: l = ratio of melt-loss; b_2 = proportion of trimmings.

the relationship between the taxation of trimmed and untrimmed sheets and circles, and treated all clearances as if they were in the trimmed form only, paying the higher rate of duty but on a lower weight. Thus, in following the input side approach for reconstructing the tax base, we shall be able to consider the total weight of flats only in a trimmed condition. This procedure helps us get round the problem of dividing the potential tax base into trimmed and untrimmed categories.[1] It should further be pointed out that in terms of the actual figures, only a small proportion of clearances relates to untrimmed sheets and circles.

[1] This might involve a minor discrepancy if the implicit ratio of recycling of trimmings in the existing rate-differential does not fully reflect the correct picture of the industry. The discrepancy involved is of the order of Rs 7 lakh per 10,000 tonnes of clearances of untrimmed sheets and circles, if the correct parameters in the industry for the ratio of trimmings is .25, whereas the one reflected in the rate-differential is .15.

Estimation of the Extent of Evasion

We shall estimate potential excise tax revenue from copper by applying effective tax rates to the potential tax bases of the three relevant sub-items of item 26-A, *viz.*, (1) and (1a), (2) and (3), separately. We shall then make an item-wise comparison between the potential and the actual tax revenue, thus providing an estimate of evasion for each sub-item.

a. *Tax revenue from copper in any crude form.* The declared production and clearance of cathodes and wire-bars, respectively, by Hindustan Copper Ltd., for the year 1978-79 were as follows:

(Tonnes)

	Production	Clearance
Wire-bars	13235.93	12741.48
Cathodes	8112.58	8042.03
TOTAL	21348.51	20783.51

Since the production incentive scheme (Notifn. 198/76) was operative in the year 1978-79, a total of 7557 tonnes were cleared at 75 per cent of the basic duty of Rs 3,000 per tonne, that is, at the rate of Rs 2,250 per tonne. Thus, the total basic duty from copper in any crude form can be calculated as given below:

(Rs '000)

7557 tonnes at Rs 2,250	=	17003
The remaining amount i.e., (20783.51 — 7557) = 13226 tonnes at Rs 3,000 per tonne	=	39678
TOTAL	=	56681

This, of course, matches the actual tax revenue raised which is Rs 56679 thousand.

In the year 1978-79 the simplified procedure was also applicable under which some copper in any crude form was cleared by manufacturers other than the primary producer (a total of 265 tonnes) giving a total revenus of Rs 104 thousand.

Thus, in the case of item 26-A(1, 1a), we do not have any evasion to highlight.

b. *Tax revenue from sheets, circles, etc.* In order to determine the tax base for item 26-A(2), we represent relevant variables and parameters in the following manner:

(i) A is the amount of virgin metal (domestic plus imported allocated (used) in the production of flats;

(ii) a proportion r of total available[2] scrap (B+I+P), where B is domestic old scrap, I is imported scrap and P is marketed process scrap, is used in the production of flats;

(iii) due to the addition of alloying materials, the weight of the virgin metal goes up in weight by a factor (n-1); and

(iv) due to the addition of alloying materials, the weight of the scrap utilised in the manufacture of flats goes up by a factor (m−1)

Thus, for the initial cycle, the total weight of copper and copper-base alloys is

$$[nA + mr\,(B + I + P)]$$

Due to process recycling between flats cleared in a trimmed shape and downstream activities in converting these flats into final articles, the initial weight is increased by a factor $(1/1-bl^2)$ as discussed in Section 2 of this Chapter.

The total production of flats, starting with an initial amount and going through the sectoral process recycling *vis-a-vis* the downstream activities of this sector, would come out to be:[3]

$$[nA + mr\,(B + I + P)]\left(\frac{1}{1 - bl^2}\right)$$

This provides us with the hypothetical tax base on which the necessary effective rate of duty should be applied.

We have used the following values for the relevant variables and parameters.

A = 10,000

B = 40,000 (as estimated in Chapter 1)

[2] This does not include sectoral recycling of process scrap which is accounted for subsequently.

[3] The expression within brackets takes the place of 'A' in Table 2.1, and for b_2 we are just writing b.

I = 22,264
P = 6,720
n = 1. 35
m = 1. 29 } (and a range of values for m.r taken together)
r = 0. 40 }
l = 0.985
b = 0. 35 (and a range of values)

For some of the parameters, we have used what we consider are relatively firm estimates. For some others, we have simulated over a reasonable range of values. The derivation of the levels of the determinants is discussed below variable by variable.

(i) *Estimation of use of primary copper in flats (A).* The total production of primary metal in the form of wire bars and cathodes in 1978-79 was 20,785 tonnes. Furthermore, 68,880 tonnes of primary metal were sold by the MMTC during this year. Out of a total of 89,663 tonnes, about 18 per cent was allocated to the sector labelled "semis and alloys" consisting primarily of flats, hollows (i e., pipes and tubes), and castings. Thus, about 16,139 tonnes was allocated to this sector.

From the production figures for pipes and tubes declared to Central Excise authorities, we have worked out (see Section c) a figure of 2,500 tonnes (approximately) as virgin copper consumed in the production of pipes and tubes. Furthermore, on a rough estimate, approximately 3,700 tonnes of virgin copper are being allowed for as having been used in the manufacture of other products of alloys. Thus, we have a figure about 10,000 tonnes of virgin metal used in the manufacture of flats at the very minimum.

This figure is corroborated by the following analysis. A capacity of about 45,000 tonnes per annum for making flats exists in the country in the organised sector. According to the information provided to us by the Indian Copper Information Centre, Calcutta, about 40 per cent of the capacity was utilised in the organised sector in 1978-79. In their estimate, something like 10,320 tonnes of copper and alloying materials were used by the organised sector out of which the

share of copper was estimated to be 7,998 tonnes. Apart from some process scrap, most of the copper used by the organised sector is virgin metal. Making a deduction of 1,500 tonnes for the use of process scrap, and allowing for at least 2,500 tonnes of consumption of virgin copper in the non-organised sector, a figure of 10,000 tonnes of primary copper consumed in the manufacture of flats is obtained. This figure, thus, appears to be a reasonable estimate.

(ii) *Estimation of the level of marketed process scrap (P).* For this purpose, it is useful to divide manufacturers of copper into the following categories:

(a) Drawn wire products (winding wires, wires, cables)
(b) Rolled products (sheets, circles, strips)
(c) Extruded/drawn products (solids and hollows, other than (i) above
(d) Forged products
(e) Cast products
(f) Powders and chemicals

The manufacturers of rolled, forged and cast products are likely to use all of their process scrap arising in their own factories or in the downstream activities related to their products. On the other hand, manufacturers of wires and cables are likely to put out a substantial portion of their process scrap on the market. It is estimated that something like 20 per cent of process scrap is generated in this sector and about 80 per cent of this is sold in the market. Most of the input in this sector is virgin copper. Some good quality old scrap is also used.

The quality of available domestic plus imported virgin copper was about 90,000 tonnes in 1978-79. According to the sector-wise allocation figures (*Report of the Working Group on Non-Ferrous Metals*, 1980), 50 per cent of this quantity was assigned to the wires and cables sector. Thus, we have 45,000 tonnes of copper utilised in this sector. Furthermore, about 5 per cent of old scrap (40,000 tonnes), i.e., 2,000 tonnes may also be included as utilised in this sector, giving a total of 47,000 tonnes. Using the ratios mentioned earlier, 8,400 tonnes of this quantity is scrapped and 6,720 tonnes of it is

out to the market, the rest being used in the wires and cables sector itself.

The term "market process scrap" in this discussion is taken to mean that scrap which is generated in the production activities of one sector including the downstream processing of its products, but which becomes available for use in other sectors[4].

(iii) *Estimation of production of utilisation of scrap in teh flats' sector* (r). The main user sectors of old scrap, marketed process scrap and imported scrap are the manufacturers of rolled, cast and forged products. From available information from the trade, as also from a comparison of installed capacity of different types of producers such as forgings, foundries, rollers, extruders, etc., we have worked out the following ratios as pertaining to the use of old scrap in different sctors.

TABLE 2.3

Sector-Wise Utilisation of Scrap

Sector	Percentage share
Drawn products (wires)	5
Rolled flats	40
Extruded/drawn hollows and solids	10
Forged and cast products	35
Others	10

For our purposes, only the percentage share of 40 for the rolled products is pertinent. Even if the relative shares of other sectors may be marginally in error, the relevant point for the present exercise is that their shares taken together should add to about 60 per cent.

(iv) *Estimation of the alloying coefficient* (n). According to the general understanding in trade, as also the figures supplied to us by the Indian Copper Information Centre,

[4] Inter-sectoral exchanges of process scrap between other sectors are minimal and are assumed to cancel out in the present context when movements to and from the flats' sector are considered.

Calcutta, about 25 per cent of unalloyed copper is used in making copper flats, while the remaining 75 per cent would be used for making flats of alloys. Using a ratio of 65:25 between copper and alloying materials, after such materials are added, the initial weight of the primary metal used in the flats' sector (A) is raised to the following level:

$$.25\,A + \frac{100}{65}\,(.75\,A) = 1.3538\,A$$

This gives a value of n = 1.3538; or, (n − 1) = .3538. Thus, the weight of the primary metal goes up by about 35 per cent due to the addition of alloying materials in the flats sector.

(v) *Estimation of the alloying coefficient* (m). M indicates the factor by which the weight of scrap used in the manufacture of copper flats and flats of copper-base alloys goes up due to the addition of alloying materials.

The scrap used in the manufacture of flats, in terms of the symbols we have used, is

$$r\,[(B + P) + Ic + Ia]$$

where Ic and Ia, respectively, represent imports of copper scrap and scrap of copper-base alloys. For these, exact figures are available, *viz.*, 9,886 and 12,378 tonnes, respectively, for the year 1978-79.

Domestically available scrap (B + P) is also of two types: copper scrap and scrap of copper-base alloys. The dominant portion of allocation of primary copper in the year 1978-79 as also in earlier years has been for copper products, especially wires and cables. The proportion allocated for alloys has remained below 20 per cent over the years. Considering that about 80 per cent of (B + P) would be scrap of copper-base alloys, we have the following figures.

Utilisation of scrap in the manufacture of flats (1978-79)

Copper scrap: $r\,[\,.80\,(B + P) + Ic\,]$	= 18905
Copper-base alloy scrap: $r\,[\,.20\,(B+P) + Ia\,]$	= 8689
	= 27594 (Tonnes)

where r = .40, as worked out earlier.

Since demand for pure copper flats would be met mostly by utilising virgin copper (for electrolytic grade uses) as also to some extent by using scrap of copper, we have supposed that 30 per cent of copper scrap (i.e., 5672 tonnes) would be uesd in making copper flats, and the remaining portion (i.e., 13,234 tonnes) would be used for flats of alloys. The weight of this would be raised by a factor (100/65) assuming an average 65:35 ratio for copper and alloying materials in this sector. Thus, a total weight of 20,560 tonnes, due to the conversion of this portion of scrap (13,234 tonnes) into copper-base alloys, is obtained.

Furthermore, even for the scrap of alloys that are to be further used in making alloys, there will be some addition of alloying materials to compensate for the loss of zinc, etc., over the past periods and to obtain desirable ratios. The alloying proportion, however, will be much smaller in this case. We assume that this factor is (100/90). The relevant figure for copper-base alloy scrap, *viz.*, 8689 tonnes, raised by this factor, provides 9654 tonnes of copper base alloys.

Thus, starting with a total weight of 27,594 tonnes of metal, we obtain a weight of (5672 + 20,360 + 9654) = 35,686 tonnes of metal, giving us a value of m = 1.2933.

(vi) *Estimation of extent of evasion in plates, sheets, circles, etc.* If we represnt the hypothetical tax-base by the symbol Q, we have,

$$Q = [\, nA + mr\,(B + I + P)\,]\,(1/1 - b1^2)$$

Since, generally, there is always a difference between production and clearance, we modify the hypothetical tax base above by the clearance-to-production ratio for flats in 1978-79 which is .9789, so as to obtain the quantity of clearance corresponding to Q. Applying an effective tax rate of Rs 735 per tonne (this includes special excise duty at 5 per cent of the basic duty as in 1978-79) on this adjusted figure, and taking the difference between this and the actual revenue raised from flats including special excise duty (Rs 41,428 thousand), we get the amount of evasion, say R, as below:

$$R = [(.9789\ Q)\ (.735) - 41428] \qquad \text{(Rs'000)}$$

Evasion as a percentage of potential revenue in the absence of evasion is then calculated as below:

$$E = (R/PR) \times 103 \text{ (per cent)}$$

where PR = potential revenue, i.e., R + 41428

For 1 we have used a value of .985, indicating 1.5 per cent of irrecoverable loss at the relevant stages. The levels of A = 10,000 tonnes and (B + I + P) = 68,984 tonnes are taken as relatively firm figures. Similarly, the value of n=1.35 is also taken as a firm figure. We are then left with m, r and b where perhaps a range of values should be considered. Since m and r occur together in the formula given above, we can study the effect of changes in the value of (m.r) and b.

In our estimate, the plausible value of m and r are, respectively, 1.29 and .40, given m.r = 0.516. For b, in our opinion, the plausible value is .35, i.e., 35 per cent recycling of metal *vis-a-vis* downstream activities relating to the flats' sector. Evasion, E, with these values for the relevant parameters comes out to be *21.1* per cent of potential tax revenue and Rs 11,257 thousand, i.e., Rs 112-57 lakh in absolute terms. This is 27.17 per cent of actual tax revenue for item 26-A (2).

With a view to simulating over a range of values for (m.r) and (b) we have calculated the following values for E.

TABLE 2. 4

Estimate of Extent of Evasion (E) with Reference to Two Parameters

(Per Cent)

			b		
m.r	.32	.34	.35	.36	.38
	Extent of evasion for different values of b and m.r				
0.510	17.21	19.53	20.70	21.86	24.19
0.512	17.43	19.76	20.92	22.08	24.41
0.514	17.67	19.99	21.55	22.30	24.62
0.516	17.90	20.21	21.37	22.52	24.83
0.518	18.13	20.43	21.59	22.74	25.04
0.520	18.35	20.66	21.80	22.95	25.25

Although a range of the values indicating the extent of evasion has been provided here, in our opinion the likely values of the parameters are such that the extent of evasion should be taken to be centred in this range. It would further be observed that although there is a positive change in the extent of evasion as the values of b or m.r are increased, the increases are not very substantial, for any single-step change, with the sensitivity being slightly more for variations in b rather than m.r.

c. *Tax revenue from pipes and tubes.* From the *Central Excise Year Book* for 1978-79 we obtain the following figures pertaining to pipes and tubes.

	Production	Clearance	Revenue (basic duty) (Rs '000)
Statutory rate	M.T. 304	228	2597
	No. 60	50	
Notifn. 213/63	M.T. 2649	2500	22387

For item 26-A (3), where an *ad valorem* tax rate is involved, we have concentrated on estimating evasion due to undervaluation. Furthermore, there is duty avoidance when pipes and tubes cleared at lower values and subjected to further draws in separate premises, at which point no further duty is charged. The method of estimation which we have used in the context of pipes and tubes, works out jointly the extent of revenue loss due to undervaluation and the duty-avoidance mentioned above. It should also be noted that we have not considered direct suppression of output as a prevalent means ef evasion in this context.

We have attempted to work out the revenue implication of evasion and avoidance jointly, by comparing the average implicit price of pipes and tubes in the figures reported above with the weighted average ex-factory price of pipes and tubes obtained from the trade for the year 1978-79.

According to the information provided by the trade, about 45 per cent of the tubes are copper tubes while the remaining are of copper-base alloys.

For calculating the average implicit price relating to the clearances under Notifn. 213/63 we proceed in the following manner. Suppose the average price per tonne is P. Using the proportion given above, 45 per cent of copper tubes from a total 2500 tonnes of clearances, would indicate the following apportioning of the total weight:

Pipes and tubes of copper	1125 (tonnes)
Pipes and tubes of copper-base alloys	1375 (tonnes)

In the case of pipes and tubes, the average ratio of copper to alloying materials has been indicated as 70:30. This information is needed for working out the amount of set-off for the duty paid at the crude stage which is applicable for all the copper in copper tubes and the copper portion in the tubes of copper alloys.

Thus, the total set-off considering basic plus special duty which was 5 per cent of the basic duty in 1978-79, can be calculated as below:

$(1125)\ (3.150) + (.7)\ (1375)\ (3.15) = 6575$ (Rs '000)

For an ex-factory price of P, duty (basic + special) on tubes comes out to be

$(2500)\ (.294)\ P - 6576$ (Rs '000)

This should be equal to 22387 plus 1119 for the special duty (i.e., 23506) (Rs '000)

Thus,

$$P = \frac{23506 + 6576}{(2500)\ (.294)}$$

$= 40.93$ (Rs '000 per tonne)

Similarly, the average implicit price with reference to the clearance of 228 tonnes plus 55 numbers at the statutory rate can be worked out. An average weight of 100 kg per pipe is used to convert 55 numbers into 5.5 tonnes.

This figure is added to 228 tonnes to obtain a total weight of 233.5 tonnes. Applying a tax rate of 29.4 per cent, we obtain $(233.5)\ P\ (.294) = 2597 + 130 = 2727$

or $P = 39.72$ (Rs '000)

The implicit average price of pipes and tubes at which

duty has actually been paid, thus, works out to be in the range of Rs 40 to Rs 41 per kg.

This figure may be compared with the actual ex-factory prices for the main varieties of pipes and tubes as obtained from some integrated units producing pipes and tubes. These prices along with relevant weights for different categories of pipes and tubes *vis-a-vis* their share in the total production are given below:

	Copper tubes	70/30 Brass tubes	Admiralty brass tubes	Aluminium brass tubes
Price (Rs per kg.)	50	42	48	52
Proportion in total production (per cent)	45	15	30	10

The proportions are based on expert opinions obtained from the trade. The prices relate to the actual declared ex-factory prices before the system of declaring cum-duty prices was introduced and refer to mid-1978. There are a few other varieties of pipes and tubes of alloys accounting for a minor proportion of the total output and these have, in general, a higher price than the ones given above due to a higher cost of alloying materials. So, if anything, the calculation of the weighted average price here may be a slight underestimate.

The weighted average price from these figures comes out to be Rs 48.40 per kg. Making a deduction of Rs 1.40 per kg. from this to allow for slightly lower variable costs in the smaller units as also to adjust for any upward bias in our estimates of prices due to the availability of limited information, and taking the higher figure of Rs 41 per kg. as the implicit average price at which taxes have been paid, it appears that there is still a difference of Rs 6 per kg. This, in our view, indicates the extent of undervaluation and avoidance. Applying this figure to a total tonnage of (2500+233.5), we can indicate the extent of evasion due to undervaluation plus avoidance relating to pipes and tubes, as

$$(2733.5)\ (6)\ (.294) = 4822 \qquad \text{(Rs '000)}$$

As a percentage of revenue raised from pipes and tubes including the special excise duty (this total being Rs 262.33 lakh), the amount of evasion and avoidance is 18.38 per cent. With reference to the total potential revenue (i.e., Rs 310.55 lakh), this amount is 15.53 per cent.

In addition, there might be some evasion due to clandestine removal of pipes and tubes. We have not been able to calculate the extent of evasion due to this source. However, we are of the opinion that this is not likely to be substantial as a large portion of the total output of pipes and tubes produced in the country comes from the organised sector. Furthermore, in order to take advantage of the set-off provision, inputs have to be properly related to outputs. In any case, the extent of evasion calculated by us should be taken as the lower limit.

Incidentally, we have derived a figure of 2470 tonnes (primary copper plus own process scrap) as copper consumed in 1978-79 in the production of pipes and tubes. This figure has been used in an earlier section. For working out this figure, recall that behind the clearance of 2500 tonnes of tubes we have estimated a figure 2087.5 tonnes of copper. Using the same method, we estimate 195 tonnes of copper behind the clearance of 233.5 tonnes of tubes at the statutory rate. This gives a total 2282.5 tonnes of copper which is raised by the production to clearance ratio of 1.0825 in the case of pipes and tubes in 1978-79 to account for the difference between production and clearance. Thus, a total of approximately 2470 tonnes of copper consumed in the production of pipes and tubes is obtained. This figure would be raised to about 2500 tonnes, if we allow for 1.5 per cent of irrecoverable losses between inputs and outputs.

d. *Evasion in 26-A.* Considering all the sub-items together, we have a total of estimated evasion (plus avoidance in pipes and tubes) equal to Rs (11,257 + 4822) = 16,079 thousand. The actual revenue in 1978-79 from item 26-A was Rs 1,21,663 thousand. Both the figures given above are inclusive of the special excise duty. Evasion (and avoidance) as a percentage of the potential tax revenue for the

item as a whole comes out to be 11.67 per cent. As a percentage of actual tax revenue from item 26-A, this figure is 13.22 per cent. It should be clear that the percentage of evasion for the item as a whole goes down because revenue from "copper in any crude form", where there is virtually no evasion, is now being included in the denominator. It also reduces the sensitivity of evasion with reference to variations in the values of the parameters considered in section b, thus making the results more robust when the entire item is considered as a whole.

Comments on Modes and Methods of Evasion in Copper

Our results indicate that evasion takes place basically in relation to items 26-A (2) and 26-A (3). In the context of sheets, circles, etc., the most prevalent means of evasion appears to be clandestine removal of output. For pipes and tubes, there is some evasion through undervaluation. This is supplemented by avoidance when advantage is taken of the legal definition of the term "manufacture" which requires, among other things, the transformation of a good such that it moves from one sub-item of the Central Excise Tariff to another sub-item. Thus, if pipes and tubes are made out of duty-paid pipes and tubes, they remain item 26-A (3). Since no "manufacture" is involved, no further duty can be attracted even though the new pipes and tubes have an enhanced value.

In order to get round this problem the category of "blanks and shells, therefor" has recently been introduced as item 26-A (4). Blanks and shells are extruded products. If they are subjected to just one draw, they can be cleared as pipes and tubes. Again, further duty liability would not arise when these pipes and tubes are subjected to further draws. Thus, the basic problem remains even after the introduction of a new sub-item although it is now one step removed in comparison to the situation in 1978-79 when item 26-A (4) was not existent.

The modes of evasion mentioned above are used, in our view, systematically and extensively. In addition, a few other modes and methods of evasion can be mentioned which are

subject to sporadic use in isolated instances.

In the context of the rate differential between trimmed and untrimmed sheets and circles, sometimes the former products are cleared in the latter category which bears a lower rate of duty. This can be labelled as misclassification. As far as our method of estimation of evasion is concerned, this amounts to partial suppression of output. If duty is paid on X tonnes of output at Rs 600 per tonne, whereas the appropriate rate is Rs 700 per tonne, it would amount to a suppression of (700-600) X /600 = X /6 tonnes in output.

Sometimes copper articles are misclassified as item 68 goods either deliberately or due to lack of firm defintions. Thus, 26-A (2) products may be misclassified as shapes, sections or profiles or other such products and advantage taken of the exemption of upto Rs 30 lakh of clearance under item 68. This also amounts to a suppression of output.

In the context of the distinction between wires which do not fall under item 33-B (and thus fall under item 68) and wire-rods which fall under item 26-A, it is advantageous for the producers to classify these as item 26-A goods, thus incurring no additional tax liability. We have not attempted to quantify this aspect of evasion. In any case, it would be interpreted as evasion of tax under item 68 rather than item 26-A.

Before "waste and scrap" was introduced as a separate sub-item in the tariff relating to item 26-A, manufacture of ingots, billets, etc., using imported stock of scrap of which no countervailing duty under item 26-A had been paid, could not have availed of the exemption under Notifin. 119/66, as it then existed. In case such exemption was utilised by virtue of non-declaration of output to the tax authorities, it would amount to evasion. However, this problem has since been solved by introducing waste and scrap as a separate item under 26-A, so that appropriate countervailing duty can be levied.

It is arguable that if a job order is for untrimmed sheets and circles, and if hired labour is used to trim the sheets and circles in the premises of the job rollers, those sheets and circles should first be cleared in the untrlmmed condition. It has been argued that the process of manufacture is complete

even while the circles are uncut and they should be so cleared before trimming is done. It is true that such clearances in an untrimmed shape would result in a minor revenue advantage to the government as full correction for the recycling of trimmings has not been done in the rate differential of Rs 100 in the two rates, as argued earlier in this chapter. This revenue advantage, however, does not appear to be intentional, and we have argued in Chapter 3 that the rate differential should be increased so as to fully take account of the recycling of trimmings.

In some instances, tubes such as "torch bodies" have been misdeclared as falling under item 68 and advantage taken of either the minimum exemption limit or the fact that the manufacture may have been done without the aid of power or machines. Such exemption would not be admissible if the relevent goods are proparly classified as falling under item 26-A. This is also a case of misclassification.

The declaration of copper waste in the form of scales as an item 26-A good, where duty liability would not arise if the waste arises from duty-paid copper, also amounts to evasion. Properly classified, scalings, dross and slag do not fall under item 26-A and should pay duty under item 68.

Sometimes imported and new copper pipes and tubes, after some deliberate roughing up, may be cleared as scrap, paying a lower amount of specific countervailing duty and then sold in the market after polishing or a draw as new pipes and tubes.

It should be pointed out that although we have mentioned various methods and modes of evasion, we have attempted to quantify evasion only with reference to what we consider systematic and extensive evasion. Evasion under the other categories is not expected to be substantial.

Comments on an Anomaly in the Production and Clearance Data in the Central Excise Year Books

From the *Statistical Year Books of Central Excise*, year-wise data on production reported and clearances effected under the title, "crude copper and copper manufactures, on

which duty has not been paid at any previous stage" may be compiled as given below:

TABLE 2.5

(Tonnes)

Year	Production	Clearance
1969—70	13575*	9897
1970—71	12192	11576
1971-72	12283	10972
1972—73	14293	12067
1973—74	14249	13584
1974—75	12156	10199
1975—76	16987	13045
1976—77	29269	28910
1977—78	49467	28443
1978—79	81350	51732

* Figure mentioned as 18575 in the 1978—79 *Year Book* and as 13575 in earlier *Year Books.*

Source: Directorate of Statistics and Intelligence, Central Excise and Customs, *Statistical Year Book*, 1978—79, Dew Delhi.

It would be observed that in every year, without exception, production is more than the clearance. This excess should be carried over to the next year. If in some years clearances were more than production, over time the differences would get cancelled. However, since production continues to be always more than the clearance, it is implied that there is a stock of uncleared production at the end of 1978-79 of an amount equal to (2,55,821—1,90,425/=65,396 tonnes. This appears to be quite illogical. Although we are not saying that this should be taken as evasion, it is clear that the matter should be checked by the data collecting authorities carefully so as to locate the source of the anomaly. A similar remark can be made about the production and clearance data under the title "crude copper and copper manufactures including pipes and tubes made from duty-paid copper". Apart from misprints, some double-counting might also be involved.

Summary of Findings

The following summary (Table 2.6) may be helpful in highlighting the main conclusion regarding the quantification of the extent of excise tax evasion in copper.

TABLE 2.6

Extent of Excise Tax Evasion in Item 26-A : Summary

(per cent)

Evasion in	As a per cent of	
	Actual tax revenue	Potential tax revenue
26—A (1, 1a) "Copper in any crude form"	Nil	Nil
26—A (2) sheets and circles, etc.	27.17	21.10
26—A (3) pipes and tubes*	18.38	15.53
26—A copper	13.22	11.67

* Includes avoidance.

3

Rationalisation of Tariff

IN discussing the rationalisation of the tariff relating to item 26-A, our main focus is on the issues relating to evasion and avoidance. In order, however, to make this discussion more comprehensive, we have also brought within the purview of this analysis some relevant allied issues. These relate to disputes about definitions of various copper products and the interface of item 26-A with the residuary item 68, the question of specific *vs ad valorem* duty for pipes and tubes, classification of sub-items of item 26-A in relation to the classification in Chapter 74 of the customs tariff in the context of the levy of countervailing duties, and the relative burden of the excise tax on different types of copper manufactures.

As far as evasion and avoidance are concerned, our main findings are that there is suppression of output of flat products [26-A (2)], and that there is undervaluation and avoidance in the context of pipes and tubes [26-A (3)]. Our recommendations dealing with these aspects of the issue are (i) transfer of partial duty on sheets, etc., to the crude stage, and (ii) making the duty on pipes and tubes specific-cum-*ad valorem*. However, these options have to be examined carefully. In order to open up these issues as also to highlight other aspects of the tariff, we have taken up the question of rationalisation of the tariff for item 26-A on a broader plane.

In this context, it has to be considered as to how far, within the overall canopy of the revenue objective of the government, the perspectives of the manufacturers and the

administering authorities can be accommodated in order to increase production and productivity and minimise evasion and avoidance in this industry. There is thus a need to examine these issues from the viewpoints of (i) the primary manufacturer of copper; (ii) secondary re-rollers of copper-making sheets, circles, etc.; (iii) manufacturers of pipes and tubes; (iv) tax-administering authoritise; and (v) users of copper products at stages other than those covered by item 26-A.

Since the impact of the tax at the primary stage is substantial at the existing rates, it would be useful to discuss the implications of the tax for the primary manufacturer in some detail.

Primary Manufacturer of Copper

With a specific rate of duty at the crude stage, it does not appear likely that there would be any evasion of duty by the primary manufacturer of copper in the country, especially as the firm is a government undertaking. However, there are several issues that need to be analysed in the context of the production of primary metal in the country *vis-a-vis* excise taxation. It should be borne in mind that copper prices in India are based on the London Metal Exchange prices and are fixed by the MMTC. The primary manufacturer has, therefore, no control over the price of virgin copper.

Questions relating to excise taxation which mainly concern the primary producer are taxation of inputs, differential incidence of the tax if it is administered at any early stage in the production cycle, and duty rebates under production incentive schemes. In this context, the following points need to be considered.

a. *Taxation of cathodes and/or wire-bars.* Hindustan Copper Ltd. produces cathodes which fall under item (1) of 26-A and from these cathodes it produces wire-bars which fall under item (1a) of 26-A. Cathodes are electrolytically refined copper and they have many direct applications. Cathodes are melted and cast in wire-bar moulds to make wire-bars. In this conversion, about 1.5 per cent of melt-loss is involved. In order to conserve energy, where cathodes can

be used directly, e.g., in making alloys, they are so cleared from the factory after paying the appropriate amount of duty. A government recommendation to this effect, i.e., that cathodes should be directly sold, also exists.

As soon as cathodes are produced, they are identified as copper "in any crude form", for purposes of tax under item 26-A. It is clear that for cathodes which are cleared from the factory for users outside the factory, the appropriate amount of duty should be discharged. In relation to the cathodes that are put to captive use, the practice in the past was to charge duty when the wire-bars made out of these cathodes were cleared from the factory, in pursuance of the "later the better" principle. In view of the provision of Notifin. No. 20/81 dated 20.2.1982 pertaining to Rules 9 and 49 of the Central Excise Rules, 1944, the "later the better" principle has since become redundant, as explained below.

The present practic is to ask for clearance on payment of duty at the cathode stage for those cathodes also which are to be captively consumed, and allow proforma credit adjustment. Once wire-bars are manufactured and cleared from the factory, the duty-liability has to be discharged. This duty liability is adjusted in the proforma credit balance of the manufacturer. The effective duties for cathodes and wire-bars are equal, *viz.*, Rs 3,300 per tonne [1]. However, about 1.5 per cent of melt-loss (after taking into account the re-cycled recoverable waste) is involved in the production of wire-bars from cathodes. In view of this, when we consider the two systems of administering the tax mentioned above, the following picture emerges.

A comparison of the two systems, namely, "duty-paid clearance at cathode stage and availing of proforma credit for clearancc at wire-bar stage", and "duty on cathodes/wire-bars at clearance from factory only" clearly indicates that the former procedure would turn out to be substantially costlier to the producer. In order to clarify this, consider the following hypothetical example. Suppose the primary manufacturer clears 11,820 tonnes of wire-bars, captively consum-

[1] Including special excise duty.

ing 12,000 tonnes of cathodes, annually. The corresponding monthly figures are 985 and 1,000 tonnes, respectively. Suppose the time-lag between the cleurance of 1,000 tonnes of cathodes and the clearance of 985 tonnes of wire-bars made out of these cathodes is one month.

Suppose the primary manufacturer clears 1,000 tonnes of cathodes on the first day of the month by depositing Rs 33 lakh in the PLA. It also takes proforma credit on the same day, thus transferring this amount to RG-23. On the last day of the month suppose 985 tonnes of wire-bars are cleared. The duty liability is Rs 3250.5 thousand which is debited to RG-23 and the balance of Rs 49.5 thousand remains in RG-23. Suppose this process is repeated twelve times a year. The relevant figures are given in Table 3.1.

TABLE 3.1

Implications of Duty-Paid Clearance of Cathodes with Proforma Credit Adjustment for Wire-Bars

	(Tonnes)						(Rs thousand)
Date	Clearance of		PLA		RG-23		
	Cathodes	Wire-bars	Credit	Debit	Credit	Debit	Balance
First day of month	1,000	—	3,300	3,300	3,300	—	3,300
Last day of month	—	985	—	—	—	3250.5	49.5
Repeated 12 times							
First day of last month	1,000	—	3,300	3,300	3,300	—	3,495
Last day of the year	—	985	—	—	—	3250.5	594
TOTAL	12,000	11 820	39,600	39,600	39,600	39,006	594

In this process, government revenue comes from the deposits on the first day of each month of Rs 33 lakh per month multiplied by 12. The balance of Rs 5.94 lakh remains in RG-23. This amount, however, cannot be transferred to the PLA nor can it be refunded. It appears that it cannot

also be utilised for payment of duty on cathodes which is being done through the PLA. As such this money is lost to the producer for good. The relevant provisions of Rule 56-A are quoted below:

"(3) (vi) (a)

The credit of duty allowed in respect of any material or component parts may be utilised towards payment of duty on any finished excisable goods for the manufacture of which such material or component parts were permitted to be brought into the factory under sub-rule 2 or where such material or component parts are cleared from the factory as such, on such material or component parts.

(vi) (b)

No part of such credit shall be utilised save as provided in sub-clause (a) or shall be refunded in cash or by cheque".

Furthermore, in comparison to the "later the better" principle where payment of duty would have been Rs 32.505 lakh at the end of each month in this example, the manufacturer has to obtain a credit of Rs 33 lakh for a period of one month, the process being repeated 12 times. This is so because he will get the tax element back from the customer only when the wire-bars are cleared at the end of the month, with reference to this example. The interest cost to the producer, for obtaining this credit, calculated at the rate of 15 per cent per annum, is thus Rs 4.95 lakh. In all then, in the clearance of 12,000 tonnes of wire bars, the additional cost to the manufacturer is (i) Rs 5.94 lakh due to the locked-up money in RG-23, and (ii) Rs 4.95 lakh due to the credit cost for obtaining money at an earlier stage. The total of these two elements adds to Rs 10.89 lakh, i.e., about Rs 11 lakh per year in the above hypothetical example.

The effect of point (i) above, as long as the duty on cathodes and wire-bars are at the same rate, is to virtually make the producer of copper pay duty on melt-losses which are never recovered and which never reach any users of the product. It would be appropriate if the duty is charged on cathodes as item 26-A (1) when they are so cleared from the

factory, and on wire-bars as item 26-A (1a), when they are so cleared from the factory. Duty may not be charged on all the cathodes, and again on wire-bars allowing proforma credit for the reasons already mentioned. This might involve invoking the "later the better" principle. However, recent amendments to Rules 9 and 49 of the Central Excise Rules, 1944 have the effect of making this principle inconsistent with the amended rules. Another option which might be considered in order to get round the problem raised above is to merge sub-items (1) and (1a) and redefine them in consonance with the classification in the Customs Tariff. Subsequently, we have attempted to justify this on other grounds also.

b. *Scrapping of moulds.* Anode moulds, wire-bar moulds, mould plates, and starter sheet blanks are exempt from duty under Notifn. No. 236/75 from the whole of duty if: (i) these are intended for use by the primary producers during the manufacture of copper, in the factory of production in which such anode moulds, wire-bar moulds, mould plates or starter sheet blanks had been manufactured; and (ii) the anode moulds etc. are melted, after such use in the said factory.

Due to technical reasons, many a time it is not feasible to remelt used anode moulds, etc., and these are to be sold as scrap. In this case, since condition (ii) above is not satisfied, the exemption under Notifn. No. 236/75 is not admissible. As such, duty is chargeable on fresh moulds. Later when they are cleared as scrap arising from duty-paid metal, no more duty is to be paid. It would be desirable to modify condition (ii) above to stipulate that if they are not melted after such use in the said factory, they can be cleared as item 26-A (1b), after payment of duty. This would harmonise the situation and allow duty exemption on all fresh anode moulds, charging duty only on those which are cleared out of the factory as scrap.

c. *Taxation of oxygen used as an input.* In the production of copper from copper are, reverts, that ore solid mined intermediate products, varying from 25 to 40 per cent of the matte treated in convertor, result. These reverts are treated in oxygen-enriched convertors for recovering copper. The use of oxygen speeds up removal of impurities and is an essential

part of the process. It is comparable to the use of oxygen in the LD process of steel making. There is an exemption given to the oxygen used for manufacturing iron (item 25), steel ingots (item 26) and iron and steel products (item 26AA), vide Notifn. No. 224/75 under similar circumstances. Since the primary producer does not have any control over the price of its final product, feasibility of extending the exemption mentioned above to item 26-A may be considered.

d. *Revised definition of alloys.* Since 18.6.1980 copper has been defined to include any alloy in which copper predominates by weight over each of the other metals. In view of this change in the definition, it is possible to construe, though mistakenly, that copper concentrates, copper matte and copper blister, if they contain more than 50 per cent of copper, should be cleared after payment of duty within the factory for further captive consumption.

It would be anomalous to treat copper concentrates, matte and blister as copper alloys. This matter should be clarified through executive instructions.

Manufacturers of Flats

It appears that the greatest scope of tax evasion is in the manufacture of flats, *viz.*, plates, sheets, circles, strips, and foils, especially in the unorganised sector. This is also the implication of the discussion contained in Chapter 2 of this Report. The possibility of evasion in this sector arises as there are many small-scale producers, catering to users of copper flats which are themselves operating on a small scale, sometimes just next door to the producers of flats. In adequately checking such a large number of manufacturers, concentrated geographically in a few areas, and operating in quite an organised manner as far as evasion is concerned, it is apparent that the Departmental resources would, of necessity, be thinly spread.

The Excise Department has no control over utensil manufacturers as also most other users of copper flats, and as soon as the latter enter into their premises, the Excise Department cannot have its track for verification and checks.

First, however, some of the difficulties pointed out by the manufacturers of flats (made from scrap or duty-paid virgin metal through the stage of billets) on their part need to be mentioned. These are given below:

a. *Interpretation of Notifn. No. 119/76.* The full text of this notification as it now stands is given in Chapter 1 (p. 19-22/). This notification has recently been subject to some controversy due to the interpretation of the Law Ministry at one stage, *viz.*, that since zinc and other alloying materials are not specifically mentioned in the text of the notification, when copper alloys "in any crude form" are made using zinc, etc., they should be subjected to the full amount of duty. The problem has arisen since 1979 and since then it has caused considerable uncertainty in trade for all types of manufacturers of copper who use or produce copper alloys. Apparently the Department had issued notices asking for a recovery of duty for the last five years or so. It is quite clear that whatever may be the language of the notification, the intention must be to exempt copper alloys, "in any crude form" from the whole of duty because copper alloys cannot generally be made without using virgin zinc or other similar alloying materials. Hence, the notification would be basically redundant unless it covers these cases. It appears that necessary clarification to this effect has since been issued.

b. *Taxation of scrap.* In the matter of clearance of scrap for some secondary rerollers who clear circles cut out of brass sheets, there has been a problem. Copper scrap and waste is taxed under item 26-A (1b). However, by Notifn. No. 34/81 copper scrap/waste is exempt from duty if it is used within the factory of production. Further by Notifn. No. 33/81, as amended by Notifn. No. 181/81, copper waste/scrap is exempt from duty if:

(i) such waste/scrap is manufactured from copper in which the appropriate excise duty or countervailing duty has already been paid, and

(ii) such waste/scrap arises from products falling under any other item (i.e., electric wires and cables, i.e., item 33B) manufactured or produced in India.

This notification implies that if copper waste/scrap arises out of the use of non-duty paid copper and removed out of the factory, full duty has to be paid. In the case of those secondary rerollers who clear circles cut out of brass sheets as well as the scrap that is left over after cutting circles from sheets, there is a difficulty as it cannot be said that this scrap has arisen out of duty-paid copper, that is, the sheets on which the differential duty has not been paid. The anomaly is that if such scrap is remelted and used for the production of sheets/circles again within the premises of the secondary rerollers, it will not pay duty, but if it is cleared out and melted for the same purpose by the utensil manufacturers to be sent back to the secondary rerollers, it has to pay duty. For getting round this problem, a notification providing for exemption from duty for scrap if it arises out of copper on which duty has been paid at the crude stage, is needed.

Manufacturers of Pipes and Tubes, Blanks and Shells

There are some grounds to believe that in the manufacture of hollows, *viz.*, pipes and tubes, and blanks and shells for pipes and tubes, there is some evasion, primarily in the form of undervaluation. In addition, there is some avoidance also. This arises because of the fact that whereas there are a few integrated factories producing pipes and tubes, there are also a number of extruders who supply pipes and tubes from blanks and shells after one draw, for further drawing, to small-scale manufacturers having a few draw benches. The process of further drawing pipes and tubes of smaller diameters from pipes and tubes of larger diameters does not amount to "manufacture" as the goods are not taken from one taxable sub-item to another, and as such no additional duty applies. Furthermore, these small-scale drawers are importing reusable pipes and tubes and are allowed clearance as scrap, though incorrectly, and subjecting them to further draws. Although duty will then have to be paid, in practice it may actually be evaded. Thus, due to duty avoidance, and due to the use of imported pipes and tubes cleared as scrap for further drawing, there is a clearcut revenue loss. It is necessary to find out a means by which the revenue loss due

to non-taxation of further drawing of duty-paid blanks, shells, pipes and tubes could be mitigated.

One problem that the manufacturers of pipes and tubes have faced in the recent past is related to the benefit of proforma credit under Rule 56-A, that is, taken when duty-paid inputs of "copper in any crude form" or wire-bars are brought into the factory.

Under Notifn. No. 213/63, a set-off of excise duty and/or countervailing duty already paid on copper or copper alloys in any crude form or manufactures thereof is to be allowed. In taking the set-off, the manufacturer has the option to avail himself of the proforma credit procedure.

Since 1978 prices of pipes and tubes are quoted to customers inclusive of excise duty. The determination of the ex-factory price from the "cum-duty" price in view of the benefit given by Notifn. No. 213/63, has been a matter of contention. In order to illustrate this problem the following examples may be considered.

Suppose the ex-factory price of pipes is Rs X per kg. and the duty-inclusive price is Rs 70 per kg. Given that the basic + special excise duty on copper in any crude form is Rs 3.3 per kg. and the tax on pipes and tubes is 30.8 per cent *ad valorem* inclusive of special excise duty on the ex-factory price, the problem is to determine, the ex-factory price, namely, X. The following two options may be considered for this purpose.

EXAMPLE 1

The duty exclusive price can be worked out as indicated below:

$$X + .308\,X = 70$$

$$X = \frac{70}{1.308} = 33.52$$

EXAMPLE 2

It appears that at least in some Collectorates, the method of working out the duty exclusive price was as given below:

$$X + (.308\,X - 3.3) = 70$$

$$X = \frac{70 + 3.3}{1.308} = 56.039$$

In this matter, any ambiguity has been set at rest by the recent amendment to Section 4 of the Central Excise and Salt Act, 1944. It is clear that the appropriate way to work out the duty liability in the presence of proforma credit should be consistent with Example 1 given above.

The matter should be unambiguously clarified through executive instructions.

Another problem which arises in the context of the manufacturers of pipes and tubes is the set-off relating to the use of zinc and other such materials on which appropriate amount of excise duty or countervailing duty has been paid. It is easy to see that the principle on which the set-off is given for the duty paid on "copper in any crude form", under Notifn. No. 180/81, should be extended to the use of other inputs also.

In this context, the government did come up with a notification, namely, 91/80, providing the relevant set-off. The notification provided for set-off, among other things, for the duty paid on zinc, aluminium and lead, when these are used in making copper alloys. This notification was amended vide Notifn. No. 138/81 which left the set-offs for the other alloys included in the earlier notification intact, but withdrew the set-offs for copper alloys. It is clear that the principle on which inputs are being exempted from tax, *viz.*, copper in the case of copper alloys as per Notifn. 180/81, and copper, lead, zinc and aluminium inputs in the case of other alloys, as per Notifn. No. 91/80, should be extended to manufacturers of pipes and tubes of copper alloys in respect of zinc and such other alloying materials. This problem is even more important in the context of an increase in the statutory rate of duty on zinc in the current financial year. However, it should be remarked that this set-off is needed in the context of the high rate of duty on pipes and tubes and it should not be of a general nature as in the original Notifn. No 91/80. It is not expected that there would be a substantial revenue loss due

to the provision of this set-off. It will remove an existing anomaly, and the question of increasing the tax rate marginally may be considered with a view to making up the revenue loss.

A similar problem relates to the use of old pipes and tubes as scrap for the manufacture of new pipes and tubes. Here no set-off is admissible for scrap and as such it becomes less costly to use virgin metal as compared to used metal for making pipes and tubes.

Interface with Item 68

Item 68, i.e., "not elsewhere specified", provides a major bone of contentionw hen goods made of copper or copper alloys are assessed to duty under this item due to definitional interpretations. Item 68 carries a duty rate of 8 per cent *ad valorem.*

There are some basic features of item 68. Item 68 goods are exempt from duty if these are:

(i) Produced in premises which are not defined as "factory" within the meaning of the Factories Act, 1948;

(ii) produced without the aid of power;

(iii) produced by small-scale units in respect of clearances upto the value of Rs 30 lakh in a financial year subject to certain conditions; and if,

(iv) these are intended for use within the factory of production, except when such goods are "machinery" meant for processing or manufacture of any goods.

If item 68 goods are used as inputs, proforma credit for the duty paid is allowed for adjustment against the duty due on the products made therefrom. However, no such credit is allowed for the countervailing duty paid on imported item 68 inputs. Furthermore, when duty-paid goods, belonging to any of the items from 1 to 67, are used as inputs for producing item 68 goods, no set-off or proforma credit is allowed.

Goods made from copper, if not specified under item 26-A, or any other item in the tariff, have to pay duty under the residuary item. Copper is a costly item. At an average price

of, say, Rs 40,000 per tonne for copper products, the limit of Rs 30 lakh is crossed after the clearance of just 7.5 tonnes of products. After that the duty incidence is very high because of lack of appropriate set-off facilities for the excise duty paid at the crude stage. In view of this, the duty incidence on products of copper may be substantially higher if they get assessed under item 68 and miss the specification under item 26-A even by a narrow margin. As such, definitional clarity assumes considerable importance.

In the tariff, various expression like "bars", "wire-bars", "wire-rods", "rods" and "wires" have not been specifically defined in the context of item 26-A.

Some of the important definitional problems that have arisen from time to time in the past are mentioned below.

(i) There has been a difficulty relating to the distinction between wires and rods, the relevant parameters establishing the distinction being (a) the length of the diameter (10mm. or 6mm. being alternative dividing lines), and (b) whether the supply is in straight lengths or coils. Due to changing interpretations, the trade has had to put up with much confusion. In order to put all controversy at rest, it is necessary that the relevant definitions should be provided in the tariff itself.

(ii) Similar problems have arisen in the case of (a) copper and brass round rods, copper and brass squares and hexagonal rods in coil form and (b) copper and brass sections and profiles and brass wires. The position at the moment is that items mentioned under (a) above are being taxed under item 26-A, and those under (b) are being taxed under item 68, vide CBEC letter No. F-138/10/79 CD 4, dated 27-11-1979.

(iii) A similar problem relates to whether hollow rods and sections should be taxed under item 26-A or 68. It has been considered that hollow rods are not pipes and tubes. Sections are also in irregular shapes. The position at the moment is that the product (*viz.*, bars) would first pay duty as rods under item No. 26-A (1) and they would then pay duty as hollow rods and sections under item 68.

As a general principle, it is desirable to give unambiguous definitions of various copper items within the tariff itself. Furthermore, it is better to specify, after due consideration, such copper manufactures as easily reach the limit of Rs 30 lakh, within item 26-A so that proper tax credit for the crude-stage duty can be given where necessary rather than leaving them in the stranglehold of the residuary item.

Classification

The classification pertaining to copper and copper manufactures in the Customs Tariff is far more exhaustive than that for item 26-A of the Central Excise Tariff.

The question of a proper and adequately exhaustive classification assumes importance from the point of view of (i) countervailing duties, and (ii) the difficulties in relation to item 68 *vis-a-vis* 26-A. It is obvious that since imports have to pay countervailing duties according to the excise tax rates applicable for domestic production, the customs classification and the excise classification must at least broadly tally. Secondly, in view of the points raised in the previous section, it seems desirable that most articles of copper should be specified outside the scope of item 68. For a good like, say, brass wire of less than 10mm. diameter supplied in coils as compared to brass wire (rod) of 10.1 mm. diameter in straight lengths, the duty differential is substantial. The latter does not pay any duty, while the former pays 8 per cent *ad valorem* without any set-off for the crude-stage duty as in the case of pipes and tubes. In any case, the more clearly the taxable goods are defined or specified, the greater is the attention that can be paid to their tax incidence rather than when they are left within the purview of item 68.

From a comparison of the excise classification with the customs classification relating to copper, the following observations can be made.

(a) Products mentioned under 26-A (1) and (1a) are unwrought forms of copper. This includes wire-bars even though they have tapered ends.

(b) Only five semi-manufactures have been defined under

26-A (2), namely, plates, sheets, circles, strips and foils. Semi-manufactures are generally obtained by rolling, extruding, drawing, or forging. In the customs tariff, chapter headings 74.03 to 74.06 have specified the semi-manufactures as below:

(i) Wrought bars, rods, angles, shapes and sections of copper; copper wire;
(ii) Wrought plates, sheets and strips of copper;
(iii) Copper foils (whether or not embossed, cut to shape, perforated, coated, printed or backed with paper or other reinforcing material), of a thickness (excluding any backing) not exceding 0.15mm.; and
(iv) copper powders and flakes;

(c) Pipes and tubes and blanks and shells for pipes and tubes are the only articles of copper that have been separately specified by the Central Excise Tariff. Other articles, given in headings 74.07 to 74.08 BTN have been missed out in the Central Excise Tariff.

These articles are mentioned below:

(i) blanks for tubes and pipes[2] and hollow bars;
(ii) tube and pipe fittings (e.g., joints, elbows, sockets and flanges) of copper;
(iii) reservoirs, tanks, vats and similar containers, for any material, of copper, of a capacity exceeding 300 l., whether or not lined or heat insulated, but not fitted with mechanical or thermal equipment;
(iv) stranded wire, cables, cordage, ropes, plated bands and the like, of copper wire, but excluding insulated electric wires and cables;
(v) gauze, cloth, grill, netting, fencing, reinforcing fabric and similar materials (including endless bands), of copper wire;
(vi) expanded metal, of copper:
(vii) chain and parts thereof, of copper;
(viii) nails, tacks, staples, hook-nails, spiked cramps, studs,

[2] Included in item 26-A (4) since 1.3.1981.

spikes and drawing pins of copper or of iron or steel with heads of copper;

(ix) bolts and nuts including bolt ends and screw studs, whether or not threaded or tapped and screws (including screw hooks and screw rings, of copper; rivets, cotters, cotter-pins, washers and spring washers, of copper;

(x) springs, of copper;

(xi) cooking and heating apparatus of a kind used for domestic purposes, not electrically operated, and parts thereof, of copper;

(xii) other articles of a kind commonly used for domestic purpose, buildings' sanitary ware for indoor use, and parts of such articles and ware, of copper; and

(xiii) other articles, of copper.

Out of these, apart from blanks and shells, specified under item 26-A (4) since 1.3.1981, wires and cables specified under item 33B, and bolts and nuts which fall under item 52, the other articles would attract duty under item 68. We have subsequently suggested that copper articles where the turnover of a small-scale unit is likely to easily exceed the limit of Rs 30 lakh, should be brought from item 68 to item 26-A.

Revision of Item 26-A: Aspects of Evasion

The upshot of the argument presented in Chapter 2 is that for item 26-A, evasion of excise tax arises mainly in relation to the production of flats. Apart from this, there is some evasion/avoidance in pipes and tubes. Furthermore, misclassification of item 68 goods as item 26-A goods might also be leading to some evasion although this is evasion under item 68 rather than that under item 26-A.

In order to deal with evasion with reference to item 26-A (2), there are two options open to the government:

(i) transfer 26-A (2) from SRP to physical control procedure; or, evolve a more stringent system of checks and controls while still applying the SRP;

(ii) abolish the partial duty on item 26-A (2), transferring the tax-incidence of item 26-A (1) for making up the revenue loss.

Option (i) above may not, however, be very successful. The units involved in manufacturing 26-A (2) items, especially in the unorganised sector, are numerous. The cost of collection would, therefore, significantly go up. Furthermore, to the extent collusion of staff leads to evasion, SRP or physical control would not make much difference.

a. *Transfer of the duty on plates, sheets, etc., to primary stage.* The second option is almost throwing the proverbial baby out with the bath water. Here, the incidence of Rs 700 per tonne, i.e., the partial duty element on trimmed sheets, circles, etc., may be transferred to the crude stage. First, it should be noted that in order to make up for the revenue loss due to the abolition of the Rs 700 duty on flats, the increase in the crude stage duty is very nominal when countervailing duties are also taken into account, as they must be. For example, in 1978-79, the revenue from flats was Rs 394.55 lakh (Table 1.9). Clearance of "copper in any crude form" was 20,781 tonnes(Table 1.8). Furthermore, imports for items that will pay the crude-stage countervailing duty including scrap was 91,970 tonnes. In order to make up the loss of Rs 394.55 lakh, from a tax base of (20,781+91,970 =) 112,751 tonnes, one would only need to levy an additional duty of about Rs 350 per tonne. Thus, if the basic duty is increased from Rs 3,000 to Rs 3,350, all the necessary revenue is recovered In order also to recover the unobtained revenue due to evasion, the increase in the crude-stage duty should be about Rs 450. It should be noted, however, that the shift suggested is not from a final stage to the primary stage, but only from an intermediate stage to the primary stage

Some of the important implications *vis-a-vis* the transfer of the tax at the crude stage are mentioned below:

(i) The same or augmented revenues would come from excise tax and countervailing duties taken together.

(ii) Difficulties about movement of scrap between circle rollers and utensil makers would be removed as there is no duty-liability at the sheet stage.

(iii) Administratively, the task of collection of revenue would be very simple. The domestic producer being a public undertaking, and imports having to pass through necessary formalities, the possibilities of evasion would be minimised.

(iv) There would not be any increase in the tax liability for pipes and tubes, since they get set-off for the crude-stage duty.

(v) The burden on the primary manufacturer will increase in view of the points discussed in Section 1a. However, their problems need to be solved even with reference to the existing structure of rates. The change suggested above must not be implemented without working out a solution to the problems.

(iv) Under certain circumstances, there would be an increase in the duty incidence of other articles made from:

(a) domestically produced virgin copper;

(b) imported virgin copper, and

(c) imported scrap.

(vii) On imported 26-A (2) goods, there will be reduction in the duty incidence. However, apart from plates and foils, not many flats are imported.

(viii) The relative burden on copper articles which are not made from flats or pipes and tubes, e.g, articles that are directly cast or forged, will increase, from its present level. However, the existing structure itself seems inequitous, in that it permits a lower incidence of tax on articles made through castings and forgings.

(ix) Articles made from copper which fall under items other than 26-A, such as electric wires and cables (33B), zip fasteners (61), and cooling coils [29A (3)], there will be a higher incidence of duty. In these cases, it should be considered whether the effective rate of duty should be reduced so as to maintain the status quo.

The transfer of the duty of the primary stage does, how-

ever, go contrary to the standard economic advice in the matter where levying taxes on final goods and intermediate goods with appropriate set-offs is recommended so that the incidence of the tax on the users can be more effectively controlled, cascading effects are avoided and the burden on producers of primary and intermediate goods is reduced for the greater overall benefit of the industry. In the present context, it also seems a little unreasonable to leave the value-added untaxed when old scrap is reused for making flats. On the whole, however, it seems that administrative convenience and the ease with which the same amount of revenue can be earned by not only transferring the tax to the primary stage but also lowering its rate, are so substantial, that it may ust be worthwhile to make an exception to the standard economic advice on the matter.

b. *Specific vs.* ad valorem *duty for pipes and tubes*.. As far as "pipes and tubes" are concerned, the problem of duty avoidance and undervaluation referred to earlier can be taken care of by making the tax rate specific where this is calculated with reference to some "notional" price. It seems that the same amount of revenue as at present rates can be generated by having a basic tax rate of about Rs 12,000 per MT with a set-off of Rs 3,000 per MT for the crude-stage duty. The "notional" price in this case is the current ex-duty price of pipes and tubes calculated as a weighted average for different varieties.

The difficulty in this approach is that prices of pipes and tubes vary according to the dimensions, uses and the cost of alloying materials. In general, a pipe that has been subjected to a greater number of draws will have a higher price. In having an *ad valorem* tax, this additional value-added gets taxed, if duty is not avoided, as mentioned before. On economic grounds, therefore, an *ad valorem* rate seems desirable.

In view of the considerations given above, it might be worthwhile considering a specific-cum-*ad valorem* duty, thus establishing a compromise between the two ends. In the current Central Excise Tariff, there are a few cases where such a tax is levied. It should be remarked that most clearance of pipes and tubes are in terms of weight and only a

very few are cleared in terms of numbers.

The best option is of course, to continue with the *ad valorem* tax but redefine "manufacture" in such a way that drawing of pipes and tubes from pipes and tubes can be taxed. However, the precise method by which it can be made legally admissible needs to be carefully examined.

Revisions in Tariff

To recapitulate the problems that have been raised so far in this chapter, a summary of these is given below:

Primary Manufacturer of Copper

(i) Cathode stage taxation vs. wire-bar stage taxation
(ii) Taxation of anode moulds, wire-bar moulds, etc.
(iii) Taxation of oxygen as an input
(iv) Problems arising out of the revised definition of copper alloys.

Manufacturer of Flats

(v) Interpretation of Notifn. No. 119/66
(vi) Taxation of scrap in relation to manufacture of circles
(vii) Rate differential between trimmed and untrimmed sheets and circles (See Chapter 2).

Manufacturer of Pipes and Tubes

(viii) Determination of ex-duty price
(ix) Set-off for duty paid on zinc and other alloying materials
(x) Set-off for used pipes and tubes.

Issues Relating to Evasion and Avoidance

(xi) Suppression of quantity product; elimination of the flat-stage duty
(xii) Avoidance of duty in the redrawing of pipes and tubes.

Other Issues

(xiii) Definitional problems and interface with item 68.

(xiv) Taxation of scrap; imported and domestically produced.

In order to deal with these problems, the government has to use a combination of the three types of instruments that are available to it, namely, changes in the tariff, changes in notifications, and executive orders or instructions.

It is our suggestion that some of the substantive issues should be dealt with by a change in the tariff itself. In particular, points (i), (xi) and (xiii) should be dealt with in this manner. Point (xii) above can be dealt with by changing the *ad valorem* rate to a specific-cum-*ad valorem* rate; or by appropriately defining "manufacture" in the case of pipes and tubes within the Act (Section II) itself just as in the case of P&P medicines, etc. Both these options, however, need to be carefully examined.

The revised item 26-A that would take care of the relevant points mentioned above is indicated below:

RECAST ITEM 26-A

"*26-A, Copper*	*Rate of duty*
(1) Copper matte; unwrought copper (refined or not); waste and scrap	Rs 5,600 per MT
(2) Wrought bars, rods, angles, shapes and sections of copper other than hollow bars. Copper wires other than electric wires falling under item No. 33B.	Rs 5,600 per MT
(3) Wrought plates, sheets, circles, strips and foils of copper in any form or size	Rs 6,300 per MT
Option 1	
(4) Tubes and pipes and blanks and shells therefor of copper; hollow bars of copper	Rs 6,500 per MT plus 10 per cent *ad valorem* (with set-off for duty paid at earlier stages)

Option 2

(4a) Tubes and pipes of copper	28 per cent *ad valorem*
(4b) Blanks and shells therefor, of copper; hollow bars of copper	28 per cent *ad valorem*

Explanations I and II should be retained from the existing tariff. An additional explanation should be added to provide definitions for relevant terms as below:

Explanation III:

(i) "unwrought copper" includes wire-bars and billets with their ends tapered or otherwise worked simply to facilitate their entry into machine for converting them into, for example, wire-rod or tube;

(ii) "wires" means rolled, extruded or drawn products of solid section of any cross-sectional shape, of which no cross-sectional dimension exceeds 6 millimetres;

(iii) "wrought bars, rods, angles, shapes and sections" means rolled, extruded, drawn or forged products of solid section, of which the maximum cross-sectional dimension exceeds 6 millimetres and which, if they are flat, have a thickness exceeding one-tenth of the width; and cast or sintered products, of any form or size;

(iv) "wrought plates, sheets and strips" means flat-surfaced, wrought products (coiled or not) of which the maximum cross-sectional dimension exceeds 6 millimetres and of which the thickness exceeds 0.15 millimetres but does not exceed one-tenth of the width".

In view of these revisions in the tariff, the following effects should be brought about by additional notifications or revisions of existing notifications:

(i) exempt copper, matte, or unrefined copper, that is unwrought copper obtained for example by smelting (black or blister copper), or by precipitation or cementation (cement copper or copper precipitate, which is a black powder);

(ii) provide for duty-free clearance of scrap/waste on the condition that the crude-stage duty has been paid on the copper from which scrap/waste has been generated;

(iii) *Option a*

continue with the present structure of duties on plates, sheets, etc., only introducing the minor change of increasing the differential between trimmed and untrimmed circles and sheets by Rs 50 at present rates;

Option b

make the differential effective duty more on all flat products domestically produced and increase the crude × stage duty by Rs 450 per MT (that is Rs 3,450 per MT at the present rates); and, simultaneously,

(i) provide for set-off of duty paid on copper at the crude stage for pipes and tubes, blanks and shells therefor, and hollow bars; and,

(ii) provide for set-off of duty paid on alloying materials like zinc, etc., in the case of pipes and tubes, blanks and shells therefor, and hollow bars.

APPENDIX

TABLE A.1

Consumption, Import and Production of Copper (Primary Metal) (1948 to 1979-80)

(Quantities in tonnes)

Year	Consumption	Import	Production
(1)	(2)	(3)	(4)
1948	24,700		
1949	28,400		
1950	31,500		
1951	33,200		
1952	30,000		
1953	20,500		
1954	16,700		
1955	23,700		
1956	33,800		
1957	47,500		
1958	37,600		
1959	53,900		
1960	62,400		
1961	68,000		
1962	77,700		
1963	78,600		
1964	65,400		
1965	63,100		
1966	32,700		
1967	42,300		
1968	38,800		
1969	45,800		
1970	49,000		
1971-72	64,400	56,200	6,500

(1)	(2)	(3)	(4)
1972-73	57,200	54,500	8,700
1973-74	50,300	52,600	8,300
1974-75	37,800	41,800	9,900
1975-76	47,500	15,700	18,600
1976-77	54,700	40,600	22,400
1977-78	61,000	22,800	21,400
1978-79	88,000	79,100	18,600
1979-80	72,000	41,200	18,800+ 7,400*

* Copper received by HCL against toll smelting of copper reverts abroad.

Source: Government of India, Ministry of Steel and Mines (1980), *Report of the Working Group on Non-Ferrous Metals.*

TABLE A.2

Production, Clearance and Tax Revenue from Copper (Item 26-A) (1978-79)

	Production (tonnes)	Clearance (tonnes)	Revenue (Rs '000)
	(1)	(2)	(3)
1. In any crude form	7259	7152	21455
2. Wire-bars, rods, castings, NOS	5985	6072	18220
3. Wire-bars, rods, etc., from virgin metal (Notifn. 198/76)	8102	7557	17004
TOTAL of 1, 2 and 3			56679
4. Pipes and tubes	304 + 60 numbers	228 + 55 numbers	2597
5. Pipes and tubes (Notifn. 213/63)	2649	2500	22387
TOTAL of 4 and 5			24984

TABLE A.2 (Contd.)

	(1)	(2)	(3)
Manufactures of Copper and Copper Alloys			
6. Notifn. 74/65 *et al.*	27298	28237	19777
7. Notifn. 54/62 *et al.*	20162	19799	13865
8. Notifn. 31/65 *et al.*	12018	9664	5813
TOTAL of 6, 7 and 8			39455
9. Notifn. 11/76 Ordnance Factories	150	149	—
10. Notifn. 119/66	31224	29919	—
11. Notifns. 117/61 and 118/61	—	—	—
12. Notifn. 60/65	11	15	1
13. Notifn. 236/75	25	25	—
14. Notifn. 142/76	—	—	—
Simplified Procedure			
(a) Copper and copper alloys in any crude form	104	105	60
(b) Wire-bars, wire-rods, and castings NOS.	58	60	44
(c) Plates, sheets, etc.	1145	1128	440
(d) Pipes and tubes	48	48	—
Total of basic duty			121663
Special duty			6192
Miscellaneous			86
GRAND TOTAL			127941

Source: (Adapted from) Government of India, Directorate of Statistics Intelligence, Central Excise and Customs, *Year Book: Central Excise*, Vol. I, 1978-79.

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