

INCIDENCE OF TIN EXPORT TAXATION IN WEST MALAYSIA

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I. INTRODUCTION

TIN mining has historically been the second most important industry in the Malaysian economy. In fact cyclical upswings in rubber and tin export earnings have proved to be the most important growth-inducing forces [7, pp. 7–19]. Tin exports averaged about 18 per cent of merchandise proceeds, provided 6 per cent of fiscal revenue and accounted for over 11 per cent of non-government employment in major economic activities during 1955–76.¹

Unlike the marginally progressive rubber export levy, the tin duty can, for all practical purposes, be regarded as a specific ad valorem tax. The rate schedule varied in such a way that export charges on tin metal averaged about 15.5 per cent before 1961, and 16 per cent of external prices from then on (Table I). It was not until the commodity price boom of 1973–74 that a slightly graduated export surcharge was introduced for prices in excess of M\$900 per picul (p.p.)² of tin metal for both producers' income stabilization and revenue raising purposes [1, p. 42].

This paper attempts to analyze in detail the incidence of tin export taxation, together with related policy issues, in West Malaysia. Tax incidence is simply defined as the final impact or burden of a levy after various shifting adjustments have been made by relevant economic units. Attention will be focussed on both the horizontal, or intra-industry, and vertical, or inter-industry, incidence. The former refers to the tax burden borne by different producers within the same industry. The latter relates to the fiscal impact, not necessarily generated by identical taxes, on various levy payers in different industries. In addition, it

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¹ For economy of presentation and to minimize the number of footnotes and statistical references, the data quoted in this study will not be separately specified for sources. Unless where otherwise stated, they are derived from various publications from the Department of Statistics and Bank Negara Malaysia.

² A long ton equals to 16.8 piculs. One U.S. dollar is presently equivalent to about 2.50 Malaysian dollars.

TABLE I
EXPORT DUTY AND SURCHARGES ON TIN METAL AND RUBBER
(As percentage of export prices)

Prices (M\$/p.p.)	Tin Export			Rubber Export			
	Duty		Surcharge since 1974	Prices (c/lb)	Duty after 1961	Surcharge	
	before 1961	after 1961				1970-73	since 1974
300	14.9	14.9		50	4.0	—	—
400	15.2	15.9		60	4.0	—	—
500	15.3	15.9		70	6.1	2.9 ^b	1.7
600	15.4	15.9		80	7.6	2.5	3.7
700	15.5	15.9		90	11.4	2.2	5.4
800	15.6	16.0		100	14.2	2.0	7.0
900	15.6	16.0	1.3	110	16.2	1.8	8.0
1,000	15.6	16.0	3.0	120	20.0	1.7	9.0
1,100	15.6	16.0	4.5	130	20.5	1.5	10.0 ^c
1,200	15.6	16.0	4.2	140	22.7	1.4	10.0
1,300	15.6	16.0	7.6	150	26.7	1.3	10.0
1,400	15.6	16.0	9.1	160	27.2	1.2	10.0
1,500	15.6	16.0	9.5 ^a	170	29.5	1.2	10.0

Source: Data supplied by Bank Negara Malaysia.

^a For export prices in excess of M\$1,450 p.p. the surcharge is a flat levy of M\$142 p.p.

^b For export prices greater than 60 c/lb, the surcharge is fixed at 2 c/lb.

^c For export prices exceeding 130 c/lb, the surcharge is 10 per cent ad valorem.

should be noted that fiscal justice or fairness is generally accepted as one of the more relevant criteria of tax rationality. There exists, however, a serious division of opinion as to how much of horizontal or vertical incidence should be considered equitable. The degree of fiscal equity to be discussed in the following analysis must, therefore, be regarded as essentially a relative consideration.

II. THE BURDEN OF TIN EXPORT TAXATION

Taxes are paid out of producers' and/or consumers' economic surplus, which relates to the amount of personal utility gained as a result of relevant market transactions. In theory fiscal burden can be shifted forwards, resulting in higher prices for final output, or backwards, causing a reduction in factors' rewards. The scope for such a transfer varies directly with the degree of price responsiveness of the external demand for or the domestic supply of the taxed commodities. The more inelastic demand or supply is, the greater the proportion of fiscal levy being passed on to the consumers or producers.

A. Scope for Tax Shifting

The possibility for forward transfer of the tin export duty is practically non-existent because gross proceeds earned by the producers are largely exogenously determined. Domestically existing marketing arrangements and practices clearly

indicate the price-taking role of local miners. Given the metallic content of tin ore, the value of concentrates delivered to the smelter depends on the daily tin price in the Penang Exchange. This price level is, in turn, determined by bids made by domestic merchants or overseas buying agents. If on any particular day tin supply is greater than the quantity demanded, then all transactions will be conducted at the lowest bid and vice versa [12, pp. 29–35]. From the posted or ruling unit value, the net value of tin concentrates is derived after full deductions are made for locational and insurance charges, smelting costs and the appropriate amount of export duty.

At the same time, tin producers generally tend to be highly unresponsive to price fluctuations. Dredge mining, which accounted for 39 per cent of total output between 1955–76 (Appendix Table I), is a large-scale, capital-intensive undertaking. It involves therefore substantial overhead and contractual commitments in capital equipment and relatively skilled man-power. Indeed, to start dredge mining would cost up to M\$10 million compared to between a quarter to one half of a million for gravel pump operations [2, p. 37]. Dredge production can thus be expected to go on through the export cycle unless gross returns do no longer cover running expenses, which are a relatively minor cost item. Over the period 1949–69, for example, price elasticity estimates of dredging output, based on a linear adjusted Nerlovian model with a refined dummy independent variable for export control, yield a coefficient of only -0.09 [8, pp. 80–81]. The wrong sign is attributable to the steady fall in dredge number and output since the early 1960s as a result of scarcity of ore deposits over sufficiently large tracts of land [12, p. 376].

Gravel-pump mining, which provided about 48 per cent of industry output over 1955–76 (Appendix Table I), is only marginally more responsive to price variations. This production technique is small-scale and highly labor-intensive. It is therefore less able than dredges to withstand falling prices, although it appears to be better placed to take advantage of small rises in tin unit values. The price elasticity coefficient of gravel-pump mining amounted to 0.33 for 1949–69. As a whole, however, the tin industry in Malaysia can be regarded as relatively unresponsive to price fluctuations, as evidenced by the elasticity value of 0.20 for aggregate tin output within the same period.

It can be pointed out that the estimated price responsiveness of tin supplies discussed above may be unreliably biased due to three major developments between the specified years of 1949–69. Firstly, there was the substantial export price boom during the Korean War. Secondly world over-production of tin metal resulted in drastic quota restrictions on Malaysian output during 1958–60. Lastly, as noted earlier, the dredging sector was steadily declining in importance. Over 1961–69, for example, dredging output was reduced by over 19 per cent (Appendix Table I). However the coefficients of tin supply elasticities at mean,³ estimated

³ Elasticity at mean, e , is defined as $e = b (\bar{x}/\bar{y})$ where $\bar{x}$ and $\bar{y}$ are the mean values of the relevant independent and dependent variable respectively, and b is the coefficient of linear regression of y on x . Tests of significance are conducted by means of the t test and the level of significance, following normal practice, is set at 5 per cent.

by a linear regression of output over export prices for 1961–76 so as to remove the influence of export quota restrictions, appear to confirm the relatively unresponsive behavior of tin production. Price elasticities of total output and gravel-pump supply quantities were 0.01 and 0.22 respectively.⁴

As far as the external demand elasticity for tin is concerned, available evidence indicates an equally low degree of price responsiveness. Price elasticity of world demand amounted to only -0.20 , and the extent of demand responsiveness associated with individual industrial countries ranged from -0.19 for Japan to -0.52 for the United States during 1953–66 [8, p. 81]. Such low elasticity values are attributable to the derived-demand nature of tin, the cost of which in final product prices is certainly quite insignificant. However, tin is a strategic raw material and this tends to produce occasionally violent shifts in external demand, and hence prices, for this commodity.

The scope for backward shifting of the tin export tax burden is also as narrow as that of forward transfer. This is because mining workers are historically quite mobile, relatively specialized and, to a large extent, well protected by unions in matters of wages and working conditions.⁵ In particular, most dredge operators prefer to maintain their employment volume during periods of poor returns for fear of labor recruitment difficulties during the next price upswing. Moreover, a mining worker's wages consist of two elements namely the basic award and the prosperity bonus. The former is statutorily fixed and the latter operates when tin prices exceed a certain level [9, p. 36].

Any backward tax shifting is therefore probably achieved through a deterioration in workers' amenities and other benefits such as less ample provisions of free food, shelter and medical attention, and less generous Chinese New Year presents to mining families [3, p. 430].

In general, opinion is fairly uniform that the burden of tin levy is mostly borne by domestic producers out of reduced economic surplus enjoyed by factor owners. Whether or not such fiscal incidence is relatively heavy or inequitable depends on the relevant producers' capacity to pay. This, in turn, varies directly with the extent of supply expenses.

B. *Structure of Production Costs*

A tax burden can in principle be fair and equitable if each production unit is subject to similar cost schedules. This is, however, horizontally not the case. Output expenses within the tin industry differ greatly from one region, or scale of mining operations, to another. To begin with costs depend on the metallic content of deposits. However ore purity, which affects not only the recovery rate but also assay and smelting charges,⁶ varies substantially even within comparatively small areas of similar geological characteristics [5, p. 344]. In addition,

⁴ The relevant regression coefficients are statistically significant at 5 per cent level.

⁵ Although unions represent just under 30 per cent of mining workers, union-negotiated wages and conditions are generally accepted throughout the industry [2, p. 35].

⁶ Assay and smelting charges vary from M\$7.70 to M\$5.60 p.p. for 64 to 78 per cent metallic ore respectively [12, pp. 32–33].

the state of technology and the degree of mechanization employed in the mining process exert a crucial bearing on production expenses. Of the two most important methods in West Malaysia, highly capital-intensive dredge mining is vastly more efficient than smaller-scale, labor-intensive gravel pumping. Operating costs of dredges are indeed lowest among current mining techniques.

To date, there exists no definitive study of the cost structures of various processes. A careful attempt was made by the World Bank Mission in 1954 to estimate supply expenses by examining a large number of annual reports from dredging companies and from discussions with several gravel-pump operators. The mission concluded that total costs, per picul of concentrates, of dredges varied from M\$90 to M\$120, and from M\$135 to M\$275 for gravel pumps [5, p. 344].

A more recent estimate indicates that the average expenses of both dredge and gravel-pump mining, allowing for more inefficient producers, amounted to about M\$208 p.p. of concentrates in 1967 [4, pp. 248–49]. However, personal interviews conducted by this writer with representatives of three dredge and gravel pump companies and several “independent” family mining groups, and with well-informed officials of the Malaysian Treasury in 1971 appeared to confirm that the World Bank’s cost figures, adjusted upwards to changes in the consumer price index as an approximation of increases in output expenses over time, as reasonable working estimates of production costs. Given the lack of more authoritative statistics, the mission’s figures, fully indexed to the cost of living, will be used to derive and compare dredge and gravel-pump producers’ capacity to pay.

C. *Comparative Incidence of Tin Export Duty*

From Table II, where intra-industry tax burdens at different export prices associated with major tin cycles during 1955–76 are detailed, a number of observations can be drawn. To begin with, the generally inequitable impact of an indirect tax on production without provisions for differences in taxable capacity is evident. As expected the tin levy has exerted a regressively disproportionate effect on higher cost production units, although the degree of fiscal regressivity has been somewhat reduced with the introduction of a graduated export surcharge in April 1974.

More important is that tin producers have, as a whole, been very heavily taxed. In terms of absolute price levels, the duty payable during years of a price boom ranges from 26 to 36 per cent of dredge operators’ net earnings, and from 28 to 76 per cent of gravel pump miners’ net returns. And when account is taken of the fact that these producers are also subject to income taxation and a special excess profits levy since 1965, the total tax burden can be, and has indeed been, termed “exceptional” [5, p. 94] [4, p. 248]. This remark is even more apparent when an inter-industry comparison with the taxes imposed on the most important activity in Malaysia, the rubber export sector, is made. On equity grounds, the marginally steeply progressive rubber duties are a better form of statutory charge. At the break-even level of rubber supply costs, which is about

TABLE II
THE BURDEN OF TIN EXPORT TAXATION AT SELECTED PRICES
(M\$/p.p. of tin metal)

Year	Export Prices (1)	Tin Duty* (2)	Dredges			Gravel Pumps		
			Production Costs (3)	Net Earnings (4)	% (2) (4)	Production Costs (5)	Net Earnings (6)	% (2) (6)
1955	365	55	120	190	29	180	130	42
			160	150	37	366	-56	—
1960	394	60	124	210	29	186	148	40
			165	169	35	378	-44	—
1965	703	112	126	465	24	190	401	28
			169	422	26	380	211	54
1968	566	90	133	343	26	200	276	33
			178	298	30	407	69	130
1974	1,134	232	184	718	32	276	626	37
			245	657	35	561	341	68
1975	953	164	192	597	27	288	501	33
			256	533	31	586	203	81
1976	1,140	233	197	710	33	296	611	38
			263	644	36	602	305	76

Sources: Derived from [5, p. 344], and consumer price index and other data supplied by Bank Negara Malaysia.

* Including export surcharge where applicable.

35 cents per pound (c/lb), up to 60 c/lb the tax is equal to only 4 per cent of external prices. In contrast, the *minimum* amount of tin levy, on postwar price levels, has remained between 15 to 16 per cent ad valorem.

It can be argued that at higher unit values the rate of rubber taxes is greater than that of tin. For example, when prices exceed 90 c/lb the rubber duty starts to rise quadratically faster than the tin fiscal progression (Table I). However, the important difference between these two export charges is that the level of rubber levy is more positively related to producers' capacity to pay especially at lower prices. Clearly a higher duty to absorb a greater proportion of inflated taxable capacity during an export boom, and vice versa, is much more preferable to approximately the same fixed ad valorem rate over the whole cycle as was the case of tin levy before 1974.

Additionally, in terms of cost-price relationships, rubber taxes are also comparatively much less burdensome. Firstly, research on smallholding production expenses reveals that total export duty paid by an average rubber grower during 1961-62, a period of relatively high prices, absorbed about 9 per cent of his net income [10, pp. 94-98]. And over the price range from 50 to 100 c/lb, the ratio of export taxes to net earnings varied from 7 to 21.5 per cent [4, p. 244]. These taxable ratios are clearly much less than the fiscal burden borne even by the more efficient dredge operators (Table II). Secondly, even more striking is the evidence from income taxation statistics, especially between 1960-69. The tin industry was less important than the rubber sector in terms of gross value of output produced and exported. The ratio of taxable earnings from tin mining

over assessable net returns from rubber planting averaged only about 85 per cent.⁷ Yet the total of tin export duties already paid amounted to almost 130 per cent of rubber export tax collections. And over the period 1955–76 as a whole, the ratio of tin export proceeds over aggregate rubber export values totalled only 45 per cent. Yet the amount of tin levies were equal to 83 per cent of rubber duties.

The third observation is that up to 1973 the tin export tax exerted a highly *destabilizing* impact on producers' incomes over the export cycle. For example, the levy caused marginal gravel-pump operators to suffer a loss and absorbed between 26 up to 130 per cent of other producers' earnings when prices were depressed, as in 1955, 1960 and 1968 (Table II). In contrast the duty ranged between 24 to 54 per cent of net returns during an export price upswing, although these incomes were now between three to six times greater than the previous cyclical levels. Such a perverse fiscal effect, which is bound to influence both employment and output within the tin industry, will be discussed more fully next.

III. IMPACT OF TIN EXPORT DUTY ON EMPLOYMENT AND OUTPUT

As noted earlier, the tin levy takes the form of an almost flat tax of between 15 to 16 per cent of export prices before the introduction of a progressive surcharge in 1974. The disadvantages of a fixed rate charge are obvious especially from an income stabilization and revenue productivity point of view. At low external unit values, too much purchasing power is withdrawn from the industry. *More* marginal producers would be squeezed out of business and the incentives to work poor mines, much *further* reduced than otherwise would be the case. When prices are rapidly rising excessive profits would be reaped by the more efficient sections of the industry. New entries would also be strongly encouraged and formerly sub-marginal deposits, reworked or mined. The government would at the same time fail to share in the windfall prosperity being earned. It follows that official collections from the tin duty would largely be unresponsive to variations in export proceeds. The elasticity of tax yields at mean, relative to cyclical fluctuations in tin earnings, was just marginally greater than unity at 1.09 during 1955–73. Such fiscal sensitivity was much lower than that of rubber levies which amounted to over 3.25, despite relatively depressed external unit values for most of the years within this period.⁸

The destabilizing impact of tin export taxation, in terms of exit and entry or employment and output, can now be explored. Rapidly rising external prices between 1960–66 produced a correspondingly fast increase in the number of tin mines, from 591 to 1,137. Similarly the aggregate volume of employment more than doubled within these years (Appendix Table I). Relatively small declines in tin prices during the subsequent downswing phase resulted in a slight reduction

⁷ Corporate income taxation data are provided by the Department of Inland Revenue, Kuala Lumpur.

⁸ The relevant regression coefficients are statistically significant at 5 per cent level.

in the totals of operating mines and mining workers between 1967-73. Two interesting features concerning the behavior of entry and exit can be noted. Firstly, the number of gravel-pump mines has appeared to be relatively less insensitive to short-term movements in export prices than dredges. As already noted, this can be attributed to the economic nature of each production technique. Capital-intensive dredges require very high investment outlays on a very large tin field. It is, however, an extremely efficient mining method. In contrast gravel pumping is comparatively a small-scale, labor-intensive and high cost operation. It is therefore less able than dredges to withstand falling prices although it is more flexible in exploiting sub-marginal deposits made economic during the early phase of the price upswing.

The second feature relates to the gradual decline in importance of dredge mining. This trend is solely due to the scarcity of ore bodies over a sufficiently large area [12, p. 376] rather than falling external unit values. At the same time the substantial increase in non-dredge mines, in response to rising prices during the early and mid 1960s, was rendered possible *not* by any major tin discoveries but simply by re-working poorer grade deposits abandoned and/or by-passed in less fortuitous years.⁹ For example, the economic recovery rate for dredges averaged 0.46 pound per cubic yard (lb/cy) in 1954 [5, p. 243]. As a result of rising prices, dredge mining was carried out in areas yielding less than 0.27 lb/cy and gravel pumping, less than 0.33 lb/cy in 1963 [12, pp. 386-87]. Consequently, although the number of tin mines was increased by 92 per cent between 1960-66, falling marginal productivity rendered output to rise by only 36 per cent (Appendix Table I). And when export unit values started to decline during the second half of the 1960s, some dis-investments took place within the non-dredge sector.

It is therefore apparent that the burden of tin export taxation has produced some resource wastage in that it causes otherwise economic deposits to be abandoned, and unnecessarily hastens the exhaustion of known resources being exploited through selective, rather than mass, gravel-pump mining to maintain profitability.¹⁰ At the same time the duty was also exerting a cyclically disruptive influence on output and employment, particularly before the introduction of a graduated surcharge in 1974. Its relatively fixed rate clearly failed to insulate a large section of the industry from the destabilizing effect of violative price fluctuations. This failure is well summarized by the relevant instability indices¹¹

⁹ It is true that improved mining methods may render the working of previously sub-marginal tin fields profitable. However the last important technological improvement, dredging, was introduced in Malaysia almost sixty years ago [12, p. 387].

¹⁰ Similar disincentive effects caused by heavy export taxation also operate in, among other developing countries, Haiti [11] and Thailand [6].

¹¹ Several instability indices, giving trend-corrected results, have been developed to measure the degree of short-term fluctuations. The more commonly used normalized standard error is computed in this study. This instability indicator, I , is defined as $I = SE/M$ and:

$$SE = [\sum (X_t - X_t^*)^2 / N - 2]^{1/2}, \quad M = \sum X_t / N$$

where X_t is the observed value of the dependent variable under observation, and X_t^* is the trend value of X_t predicted from a linear regression against time. Thus $X_t^* = a + bt$ where $t = 1, 2, \dots, N$.

TABLE III
INSTABILITY INDICES OF TIN EXPORT PRICES, GROSS AND NET TIN EARNINGS,
TIN MINES, OUTPUT, AND EMPLOYMENT, 1955-76

	1955-73	1955-76	1961-73	1961-76
Tin export prices	109	190	110	188
Gross tin export earnings	152	183	109	160
Earnings net of duty ^a	157	167	117	144
Gravel-pump mines	189	204	146	168
Gravel-pump output	185	198	125	169
Dredge mines	164	157	31	31
Dredge output	121	118	51	51
Tin employment	170	165	113	121
Taxable income from tin mining companies	305 ^b		234 ^c	
Deductible expenses for tin mining ^d	190 ^b		141 ^c	

Sources: Computed from data supplied by the Department of Statistics and the Department of Inland Revenue, Kuala Lumpur.

^a Including export surcharge where applicable.

^b For 1955-70 only.

^c For 1961-70 only.

^d These are the difference between taxable corporate income from tin mining and tin export earnings net of export duty.

for 1955-73 and 1961-73 presented in Table III. Firstly the number of tin mines, the volume of output, especially from the gravel-pump sector, and the level of aggregate employment fluctuated *more seriously* than the instability in external prices. This could be mainly attributed to the fact that the income flow to the industry, which was equal to gross tin earnings *net* of export taxes, was more unstable than both tin export prices and total tin export value (Table III). In other words, the export tax indirectly *aggravated* the externally-induced disruption suffered by the tin industry. It would indeed be highly interesting if this destabilizing impact on employment and output could be directly quantified. Such a study is presently very hard to undertake because detailed aggregate data on the labor and capital structures within the production functions associated with various mining units are non-existent.

Another related issue is that (income) taxable earnings from mining companies exhibited much greater fluctuations than deductible production costs, the bulk of which represented domestic factor and service payments. As business corporations were taxed at a fixed rate of 30 per cent before 1959 and 40 per cent of assessed returns since then, foreign and domestic investors in tin mining were apparently receiving a very unstable flow of dividends and profits. It follows that these investors might have borne a relatively greater share of tin export instability than mining workers and other service suppliers in West Malaysia.

Policy Implications

A strong case could have been made to incorporate a steeply graduated tax

schedule at high prices but tapering off at lower price levels, with a cut-off point below which no duty would be collected, into the 1961 revision of the tin export levy so as to ease the fiscal burden during periods of depressed external unit values, and raise government share of inflated profits in a upswing phase. Such an arrangement would have achieved some important effects. To begin with, the exploitation of much lower grades of deposits would have been more strongly stimulated between 1961-63 when prices were still relatively low. This would, in turn, have accelerated the recovery of the tin industry after the removal of quota restrictions on Malaysia in 1960. As it was, it took about four years for tin output, and the number of tin mines and workers to return to the pre-restriction activity levels (Appendix Table I). Yet during the period 1961-64, world production fell short of consumption by an annual average of 12 per cent [12, p. 335]. It was this shortage that caused tin prices to spiral in the mid 1960s.

Secondly, the incorporation of a marginally progressive rate structure in the 1961 tax change would have also enabled the government to absorb some windfall prosperity enjoyed by the tin industry when prices were rising rapidly between 1960-66 and remaining at high levels over 1967-73. In fact the government was fully aware of the need to cushion domestic producers from the inflationary impact of an export price upswing, and to raise extra fiscal revenue so as to compensate for the drastic fall in rubber tax collections due to low prices in the 1960s. A tin profit tax of 10 per cent was introduced in 1965, provided that net unit earnings were in excess of M\$100 p.p. and that total such net returns were greater than M\$10,000 per mining concern.

There are reasons, however, to believe that this policy response was relatively late in timing and inadequate in magnitude. Given total production costs ranging from M\$126 to M\$380 p.p. and the current rate of tin levy, a unit profit in excess of M\$100 p.p. could be realized at prices greater than M\$275 p.p. for the most efficient operations and M\$575 for the high cost units. A total net returns of M\$10,000 could thus be achieved by any of these producers with a total output of over 6 tons. Since 1955 and 1964 tin prices have never fallen below M\$365 and M\$575 p.p. respectively. At the same time the relevant output of dredge and gravel-pump mines averaged almost 310 tons and 30 tons of tin metal during 1955-76. It follows that the provisions of the tin profit tax had been met by low cost concerns since 1955 and by more inefficient operators since 1964. Purely in this sense, their imposition in 1965 could be regarded as rather late.

Additionally, there is evidence that this profit levy exerted an inadequate compressing impact on inflated windfall earnings. During 1965-69, for example, the average tin prices and export proceeds were respectively 33 and 38 per cent higher than in 1960-64 (Appendix Table I). Yet the tin profit tax absorbed just over 4 per cent of the increase in export incomes and totalled less than 10 per cent of aggregate tin duty collections between 1965-69. Its anti-inflationary effect appeared therefore to be insufficient and was certainly much less progressive than Schedule I rubber export tax (Table I).

Moreover a graduated ad valorem tax imposed in 1965, instead of the fixed

rate excess profit levy, would have been more preferable on two other counts. Firstly, any periodic increases in tin prices above the ceiling limits set by the International Tin Agreement would only be transitory. They would set in motion appropriate adjustments in the tin buffer stock on the one hand, and in the output and export quotas of member countries on the other. The government's main concern would thus be how to insulate the domestic industry from the disruptive impact of short-run price fluctuations. Secondly, this tax could have been introduced as a supplementary (anti-inflationary) export duty. Thus the problem of tin profit tax evasion, which has proved to be a considerable issue within the increasingly important gravel-pump sector [12, p. 374], would be substantially negated. Indeed export levies in an under-developed economy have traditionally been the easiest tax to collect and the hardest charge to avoid.

Fully aware of the problems associated with the existing tin duty and tin profit tax, and motivated by the need to raise revenue through the 1973-74 commodity price boom and to insulate the export sector from future booms [1, p. 42], the Malaysian government introduced a reasonably progressive tin surcharge in April 1974 (Table I). This surtax can be regarded as a fiscal revision in the right direction. When tin prices increase from M\$900 to M\$1,400 p.p., the extra levy will rise from 1.3 to 9.1 per cent ad valorem. This added fiscal sensitivity has resulted in a more stabilized flow of tin export proceeds, net of all duty and surcharges, to and volume of employment and output within the industry, compared to the degree of instability in export prices (Table III).

However, the present surcharge schedule still leaves much to be desired. The major issue is that when external unit values exceed M\$1,450 p.p., the additional duty becomes a specific tax of M\$142 p.p. and its marginal progressivity is then falling with higher prices. From the arguments discussed earlier and given the stabilization objective to be achieved, this is clearly undesirable and can be easily rectified by substituting some quadratic tax form, similar to but not necessarily of the same progressivity as that of rubber Schedule I, for the specific levy. A minor problem is that the surcharge is tied to a fixed starting price of M\$900 p.p. This price level will have to be modified upwards from time to time to take account of both over time increases in production costs and the rising trend of market prices. Such a need may likely prove to be administratively inconvenient and a revision lag would impose an intolerable fiscal burden on producers in future price downswings, and vice versa. This consideration is especially relevant during periods of high inflationary rates such as in 1973-75 when domestic prices were increased by 36 per cent. In this connection it should also be noted that the duty schedule has not been modified since 1961, despite a 59 per cent rise in tin production costs between 1961-76 (Table II). Consequently the already very heavy export tax burden on marginal producers tends to be further aggravated, thus forcing gravel-pump operators to by-pass or abandon otherwise economic deposits. This, coupled with the absence of any major discoveries of rich ore fields, accounted for a reduction of 18 per cent in aggregate tin output during 1972-76, despite the fact that export prices for 1974-76 were about 110 per cent higher than those in 1972 (Appendix Table I). The need to lower tin

export duty proper at prices below M\$900 p.p. is evidently pressing if exploitation of poorer ore bodies is to be encouraged.

IV. CONCLUSION

In sum tin export taxation in West Malaysia has generally been disproportionately regressive on marginal producers, and very burdensome in absolute terms as well as when comparisons are made with the tax levies borne by the rubber industry. Its almost fixed rate structure tended to exert a destabilizing impact directly on the export proceeds earned by the industry and indirectly on employment and output, particularly before 1974. The tin profit tax introduced in 1965 represented an official effort to increase the overall anti-cyclical sensitivity and revenue productivity of tin taxes. There is evidence, however, that this fiscal response was rather late in timing and insufficient in magnitude. It was not until April 1974 that a marginally progressive tin surcharge was imposed. This was a tax revision in the right direction, in terms of the objectives to be achieved, although both the duty and surcharge rate structures still leave something to be desired.

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APPENDIX TABLE I

TIN EXPORT PRICES, TIN MINES IN OPERATION, OUTPUT, AND EMPLOYMENT, 1955-76
(Output: 1,000 tons of concentrates; employment: 1,000 workers)

Year	Tin				Dredges		Gravel Pumps	
	Prices (M\$/p. p.)	Mines	Output	Employ- ment	Number	Output	Number	Output
1955	365	781	61.2	39.6	76	31.0	634	24.0
1956	387	784	62.3	40.2	78	30.7	633	24.9
1957	373	738	59.3	38.0	76	28.1	597	24.4
1958	369	417	38.5	26.2	34	19.9	333	14.0
1959	397	483	37.5	21.4	45	18.9	392	13.9
1960	394	591	52.0	27.3	69	28.0	470	17.8
1961	447	696	56.0	30.8	72	29.6	572	19.3
1962	448	704	58.6	33.6	66	28.5	592	22.1
1963	455	709	59.9	33.4	66	27.5	593	23.8
1964	619	900	60.0	34.8	69	25.7	768	26.9
1965	703	1,103	63.7	42.9	65	25.0	979	30.0
1966	645	1,137	68.9	48.5	64	23.1	1,021	36.8
1967	600	1,072	72.1	48.0	66	23.8	960	40.1
1968	566	1,110	75.1	48.5	65	23.2	994	43.5
1969	627	1,067	72.2	44.7	65	23.9	955	39.6
1970	665	1,083	72.6	45.3	61	23.6	979	40.1
1971	632	1,078	74.3	45.2	63	24.0	965	40.1
1972	627	1,044	75.6	44.6	58	23.6	940	42.1
1973	686	974	71.1	41.0	58	21.1	893	38.3
1974	1,134	1,025	67.0	42.7	56	21.7	932	35.8
1975	953	910	63.3	40.9	55	20.0	810	34.6
1976	1,140	868	62.3	39.6	53	19.0	770	33.6

Sources: Data supplied by the Department of Statics and Bank Negara Malaysia, Kuala Lumpur.