REVISED VERSION

PROFIT VARIATION IN THE MANUFACTURING SECTOR OF BARBADOS IN 1980

by

Peter Whitehall
Central Bank of Barbados

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Introduction

In the 1950's development planners in Barbados introduced a broad spectrum of incentives to develop the fledgling manufacturing sector. The incentives included exemptions of income tax, taxes on imports of raw materials, fuels and components, subsidised rental of factory space and concessional finance. [See Barbados Development Plans 1952-55, 1955-60]. The eligibility for incentives depended inter alia on the depth of processing, exportability, retained local value added and employment generation of the enterprise (see Fiscal Incentives Act 1974).

The initial strategy was one of industralisation by invitation to compensate for local deficiences in capital and technology. However, indigenous manufacturers were also eligible for incentives and capital from this source accounts for about 45% of manufacturing investment. Promotion offices were set up in North America and Europe to attract "foot loose" activities with high value to weight. There was considerable success in attracting enclave plants producing electrical components. These and other incentives did result in moderate protection levels slanted in favour of activites with higher ratios of value added to output [Whitehall 1984].

The small open developing economy may be a special case which alters the explanatory power of conventional profitability models. Firstly in such economies the manufacturing sector is often a melange of large foreign export oriented high-tech firms and small indigenous import substituting low-tech firms. Foreign investors are attracted to Barbados by a variety of factors: fiscal incentives, low wages, political stability, an easily trainable English speaking labour force, a developed communications network and easy repatriation of profits relative to alternative locations. Most of these factors are public goods (i.e. available at no significant cost) to all manufacturing activities. In fact, among these factos, it is only wage rate differentials and the discriminatory application of fiscal incentives which can reasonably be expected to influence profit variation across activities.

In contrast, indigenous firms are not concerned about wage rate differentials and repatriation of profits. Protection of the local and regional market and their ability to export are considered crucial to their survival. [Barbados Manufacturers Association, 1984]. This duality suggests the inclusion of separate variables to account for foreign and indigenous peculiarities. Again, it is important to determine whether the variables which influence the desire to invest also influence the ability to make profit.

This paper seeks to explain the variation in profit rates across activities in the manufacturing sector in 1980. This

year was chosen because it comes at the end of a fairly long period of growth in real GDP, with stable prices and exchange rates, but preceeds the recent recession, which would have changed profit relationships. Section 1 examines the relationship between revenue and cost structure and profit generation. Section 2 develops a model of profit variation for Barbados.

1. Revenue cost and profit

This section analyses revenue, cost and profit indices for twentyfour manufacturing activities between 1974 and 1980. The analysis will attempt to draw inferences about the ability to generate profit from the ability to generate revenue or minimise cost. The revenue indices used will be exports, sales and protection. The cost indices will be value added ratios, wage rates and labour intensity. Apart from trade data, reference will be made to national accounts data at producers values (which mean the inclusion of indirect taxes on imputs).* In this report, profit is defined for convenience, as "operating surplus" in the national accounts and is equivalent to the excess of sales over the value of labour payments and intermediate inputs. This definition of profit is fairly close to the Accountant's definition of gross profit. Operating surplus includes depreciation, general and managerial expense, extraordinary items and pre-tax profit; Gross profit is the excess of sales over cost of sales and occasionally excludes factory overhead and depreciation.

* Note: The exclusion of these taxes would understate exfactory sales.

Operating surplus is used in this report only for convenience. However the advantage of its use is that it does not suffer from tax avoidance or tax evasion measures which tend to understate profitability.

The manufacturing accounts were disaggregated into 24 activities using the minimum combinations of national accounts aggregates within any I.S.I.C. sub group possible without disclosure problems [table 1]. For convenience, the activities were then grouped by depth of processing (product type), exportability, value added, wage rate and labour intensity (table 2). This typology is in line with the criteria used to justify discriminatory benefit under the Fiscal Incentives Act 1974. The product group comprises 12 non-durable consumer activities, 2 durable consumer activities and 10 producer activities. The exportability group comprises 9 low export activities (with exports less than 10% of sales), 6 moderate export activities (with exports at least 10% but less than 30% of sales) and 9 high export activities (with exports at least 30% of sales). The activities were also grouped by the proportion of value added to sales in 1974. Activities for which the ratio of value added to sales is respectively, less than 30%, 30% but less than 50% and 50% or over, are regarded as respectively, low, moderate and high value added [Balassa 1982, Ranis 1982]. This resulted in 8 low value added activities, 13 moderate value added activities and 3 high value added activities. Finally, the twenty four activities

were grouped by wage rate height and labour intensity. In general, no satisfactory classifications were found in the relevant Caribbean literature. For convenience, the activities were grouped in three equal percentiles where possible. This resulted in nine low wage activities (in the range $1.92 to $3.13 per hour), 8 moderate wage activities (in the range $3.20 to $3.55 per hour) and 7 high wage activities (in the range $4.53 to $4.90 per hour) Table 2). Similarly, the manufacturing sector was disaggregated into 8 low labour intensity activities, 8 moderate labour intensity activities and 8 high labour intensity activities with wage/output ratios ranging from 10% to 13%, 14% to 23% and 24% to 40% respectively.

Exports and Sales

Manufacturing output increased at an annual average rate of 11.7%, compared with an annual average rate of 6.5% for national income, between 1960 and 1980. Over this period the growth in manufacturing exports was slightly faster than the growth in total exports. In recent years, manufacturing exports have come to represent four-fifths of total domestic exports.

A detailed breakdown of manufacturing sales, exports etc. is only available from 1974 onwards. Between 1974 and 1980, manufacturing output exports and sales increased by 7.6%, 20.4% and 15.2% per year respectively. (table 3). This resulted from

rapid growth in electronics, metal furniture and building materials. Over this period, chemicals kept pace while food and wearing apparel slowed; but these remained the largest individual activities. Non-durable consumer goods represent the largest single product item, accounting for 49.8% of sales and 42.7% of exports in 1980; for this group the ratio of exports to sales increased from 24% to 26% between 1974 and 1980. Producer goods accounted for 47.3% of sales and 53.6% of exports in 1980; this group recorded the highest average annual rate of sales growth of 18.4%; its ratio of exports to sales increased from 25% to 35% between 1974 and 1980. In contrast, durable consumer goods recorded much lower rates of growth for sales and exports. In general there is no clear relationship between the product type (depth of processing) and the stimulus to the growth of export or sales revenue. This means that depth of processing may, to some extent be an irrelevant parameter in the analysis of profit.

There is a clear pattern of revenue growth when activities are ranked by exportability. In other words it is clearly seen that high export activities recorded faster rates of growth of these indices than moderate export activities; similarly moderate export activities recorded faster rates of growth of the indices than did low export activities. In general, the performance of revenue indices improves with the degree of exportability of the activities. Hence exportability may be an important focal point in the analysis of manufacturing profit variation.

Most activities have moderate value added; sales and exports of this group accounted for 48.8% of sales and 85.8% of manufacturing exports respectively in 1980. In this group the ratio of exports to sales increased from 40 to 54% between 1974 and 1980. Sales growth ranged from 14.0% for the low value added category, through 16.1% for moderate value added activities and 16.5% for high value added activities. Revenue growth generally increased with the level of value added, but the difference in growth rates between high and moderate value added activities does not appear significant. This suggest that only a weak relationship will exist between value added ratios and profit variation in manufacturing.

Protection

Manufacturing protection in Barbados largely consists of tariffs on final products, exemptions on import duties, fuels and components and tax holidays.

Protection comprises all measures which give the domestic producer a competitive advantage over foreign competition. If protection is in the form of a tariff on competing imports, then it increases the maximum price at which the domestic producer can sell his product domestically. If protection is in the form of an exemption of import duties, than it reduces the operating cost of the enterprise. If protection is in the form of a tax holiday (exemption from profits tax) then it increases after tax profit,

in fact in all of the cases sited above, protection will increase after tax profit, or rate of return on capital investment. However, it is usual to compute protection rates in terms of the rate of return to value added before protection takes place. Such a measure is termed the effective rate of protection. In either case, protection may be viewed as a legitimate income indice.

Table 4 gives the weighted averages of selected protection measures for the activity groups mentioned earlier. In summary, an earlier study of 1980 found that nominal protection (rate of return of a tariff on sales) increased with the level of value added and exportability: however, nominal protection was inversely related to the depth of processing, being higher on consumer goods than on producer goods [Whitehall 1984]. However, there was no clear pattern of effective protection (rate of return of tariffs and other protection on free trade value added) to any of the activity groups. It was noted earlier that a relationship might exist between profits and exportability or value added. Given the consistency of nominal protection across value, added or exportability groups, and given the interpretation of protection as a revenue index, a relationship may exist between nominal protection and profit variation.

Profit Variation

Table 5 shows the weighted average profit levels and margins for various activity groups. One striking feature is that profit levels and margins do not vary considerably with the depth of processing or exportability across activity groups. In the product group, profit levels and margins (in 1980) were about the same for non-durable consumer goods and producer goods, but the profit level of producer goods was relatively small; sales and export revenue exhibited a similar trend in the product group (table 3). Similarly, the profit levels and margins of the low export and high export categories are almost identical in 1980 and fairly substantial, but relatively low for the moderate export category. Sales and export revenue by exportability exhibited a similar trend (table 3).

One reason for the foregoing is that durable consumer activities and moderate export activities were not well established in test year 1980. It is known that the foreign firms tend to specialise in high export producer goods, while the indigenous firms specialise in non-durable consumer goods. One plausible hypothesis therefore is that indigenous firms trying to increase their depth of processing from non-durable consumer goods to durable consumer goods may have encountered teething problems which have resulted in lower growth rates and lower profit margins.

The largest single activity group consists of moderate value added activities. This group accounted for 60% of total profit in 1980. Profit margins of this group averaged 13.7%, which was a little higher than the 11.2% recorded for the manufacturing sector as a whole. In general profit margins increase with the level of value added. This is an expected result since profit is an element of value added and the other element, labour payments, has not generally grown out of line with sales owing to a fairly conservative and responsible approach by trade unions.

Table 5a shows the weighted average profit levels and margins for the wage rate and labour intensity activity groups. For the eight activities with moderate wage rates (averaging $3.50 per hour) profit margins are 8.1%. However, for the higher wage rate activities, with wage rates averaging $4.57 per hour (or 31% higher than the moderate wage rate category) profit margins at 14.2% are significantly higher. Profit margins are apparently indeterminate of the level of wage rates accross activities. A more relevant measure of the impact of wages on profit results from comparison of profit margins with labour intensity. The latter is defined as the value of labour payments divided by the value of sales, with labour payments equivalent to the wage rate times the level of employment, plus net transfer payments to labour. The average labour intensity for the high labour intensity category at 24.1% is three times higher than for

the low labour intensity category, yet profit margins are twice as high. This suggests that across activities, wage rates do not hinder profits, but high profits or value added allow firms to pay high wages.

2. Regression Model

Profitability studies have centred around an explanation of price-cost margins in large developed economies, in terms of efficiency and collusion at the firm level. Carter [1978] regressed price-cost margins on concentration, capital intensity and advertising intensity for large and small manufacturing firms separately. He found that the coefficient of the variable measuring the extent of firm concentratin in an industry was positive and larger for large firms than for small firms. The difference in the size of the coefficient was taken as evidence of large firm efficiency, while the significance of the large firm coefficient was taken as evidence of collusion and higher profits therefrom. However, a more recent study by Allen [1983] points to market power (from collusion etc.) and not superior efficiency, as the dominant influence in the concentration profits relationship. Finally, there is new evidence which suggests that the concentration-profits relationship is not homogeneous across industries [Levy, 1984]. The unsettled nature of profits theory is particularly worrisome to industrial planners in third world countries, where other factors often need to be considered.

The recent literature on Profitability [Allen (1983), Kwoka (1977, 1979), Martin (1979), Weiss (1974)] proposes the following model:

PCM = F(C4, KO, CAD, G, N, DISP)

where

PCM = price cost margin (profit rate) defined as value added minus payroll divided by value of industry sales.

C4 = four firm concentration ratio defined as the sales of the top four firms divided by total industry sales. This is a measure of the collusive ability of the oligopoly in each industry.

KO = capital output ratio defined as value of fixed assets divided by value of industry sales. This accounts for inter-industry differences in capital intensity.

CAD = consumer advertising dummy. This accounts for the greater ability of firms in consumer goods industries to increase profitability through advertising. To account for systematic differences in advertising expenditures it is equal to 1 for consumer goods industries and zero otherwise. [Ornstein (1977)].

G = an industry growth measure defined as the percentage change in industry sales [between 1974 and 1980].

N = the number of firms in the industry

DISP = a geographical dispersion index to account for regional differences in industry value added in large countries, [Collins and Preston, 1969].

This model is approximated and applied to a small country, Barbados. A three firm concentration ratio, C3 is substituted for C4, since census data indicates this is the average size of the oligopoly [Table 6]. The geographical dispersion variable DISP is omitted because of the small size of the country [166 square miles]. A testable approximation of the conventional model is therefore as follows:

$$PCM = F(C3, CAD, KO, G, N)\ (+\ +\ +\ +)$$

The signs under the variables reflect the signs obtained [for the relevant parameters] in recent studies of developed countries [Allen 1983, Kwoka 1977, Porter 1979].

The alternative open economy hypothesis is as follows:

$$PCM = F(CAD, KO, GX, DON, WRD, ICR)\ (+\ +\ -\ -\ -)$$

where:

PCM, CAD, KO, are defined as in equation (1).

GX = export growth measure, defined as the percentage change in industry exports between 1974 and 1980.

DON = infancy concentration ratio, defined as average domestic sales per firm divided by total industry

s . DON reflects the competition for domestic sales within each activity and thus measures the degree of infancy for each activity. The larger is DON, the greater is infancy and the lower is profitability.

WRD = the wage rate differential, defined as the percentage excess of the industry wage rate in the US over the industry wage rate in the offshore location, Barbados.

ICR = Input cost ratio, defined as the ratio of the value of material inputs to total industry cost.

The variable DON is substituted for N, since it is the way in which firms compete for sales, rather than the actual number of firms which is important. The variable N is, to some extent, indistinguishable from other size variables such as output and wages and therefore adds little to the analysis. A choice is then made between C4 and DON, since DON is also a concentration ratio of a sort, to avoid multicollinearity. Assuming that domestic sales (adjusted for inflation) are fixed in the short and medium term, the ratio can only decline if output increases through export or the number of firms increases. For a given number of firms, an increase in the level of exports implies that the industry is becoming less infant. Given the size of the domestic market, an increase in the number of firms implies improved profit prospects through increased productivity, changes in technology, and the mix of products produced, or by finding new

export markets: for infant firms, such activities reflect increased learning [Corden (1971)]. Thus DON is the product of two approximate measures of infancy i.e. the ratio of domestic sales to output and the reciprocal of the number of firms in the industry.

Export growth is associated with higher efficiency and lower infancy. However, since protection may make profit rates on domestic sales higher than those on export sales, the advantages of exporting may not affect profit rates positively in the initial phases of development. Thus, the sign of GX is indetermine a priori. The negative sign often associated with the comparable measure G may well reflect the fact that industry growth attracts competition.

The wage rate normally has a negative impact on profitability, cateris paribus. The wage rate differential absorbs the negative relationship of both the parent country and the offshore location. The wage rate differential reflects the competitive industry advantage in going offshore. The higher this differential, the greater the attraction of foreign firms. However, the measure captures the fact that the industry distribution of wage rate induced profitability, is to come extent replicated in offshore locations.

The variable CAD captures other product characteristics apart from relative advertising intensity. One such characteristic is the relative share of imput cost in total cost. In general each product has a build in physical technological

characteristic which partly determines the ratio of material imputs to output at cost; i.e. potato chips will always be made from potatoes inter alia. The cost relationship is of course distorted by prices and efficiency considerations overtime. However, the relationship may be particularly important at a point in time across different activities. The premise is that the higher the material cost, the lower the surplus for wages and ultimately profit.

3. Regression Results

Linear and semi-log specifications of the conventional and small open economy [SOE] models are tested using OLS for census year 1980 using cross section data for 24 manufacturing activities. The classification of products into activities is largely based on the international standard industrial classification [See Table 1]. In most cases census data is used. Capital output ratios were derived from depreciation values asuming a ten percent straight line rate for all activities. Labour productivity (introduced below) is computed from derived employment; the latter was obtained by deflating industry wages by industry wage rates. (See Apendix)

The regression results are presented in table 7. The conventional model, represented by equations 1 and 1a does not compare favourably with previous developed country results in terms of the significance of the coefficients. Most of the coefficients are insignificant and the explanatory power of the model is poor as indicated by the R - squared and F statistic.

The SOE model is presented in equations 2 and 2a [table 7]. Export growth is substituted for growth (in sales) and infancy concentration for oligopoly concentration and the number of companies in the industry. In addition, the wage rate differential and the input cost ratio are included. The result is that explanatory power increases markedly with all variables having correct signs and significant at the five percent level. [The sign of the export growth measure was of course not determined]. Both specifications give fair results but the semi log (equation 2) variant is superior. Product characteristics hav a significant effect on profits. The size of the elasticity coefficient indicates that a ten percent increase in the input cost ratio would raise profits by about 20% (table 8]. Similarly, a ten percent increase in advertising potential would raise profits 10.6%. Export growth and wage rate differentials are significant but have very little impact on profits.

Infancy concentration has the most significant impact on profits; even greater than that of capital intensity. The elasticity coefficient indicates that a ten percent reduction in infancy concentration would raise profits by 172%; i.e. profit rates of about ten percent in 1980 could be raised to 17%. Based on the ratio of exports to sales, such a rise would require real increases of 12% in output and 39% in exports given domestic sales and the number of firms in the industry.

Table 9 presents results of an attempt to refine the SOE model. Firstly, the conventional growth and concentration variables were substituted into the SOE model (equations 3 and 4 respectively). Comparison of equations 2 and 3 indicate that infancy concentration is superior to oligopoly concentration which is not significant at all. Similarly the explanatory power of the export growth variable exceeds that of the conventional growth measure. Secondly, wage rates and nominal labour productivity were substituted for the wage rate differential. Wage rates were inferior [to the wage differential variable] but significant at the ten percent level. [See equations 2 and 5]. The surprising result is that labour productivity denoted VE was not significant at all. [Equation 6]. A protection variable was added to the SOE model since protection is normally expected to increased profit rates in infant industries - Balassa (1971). However protection was insignificant. [See equation 7].

Summary and Conclusions

Over the last thirty years, industrial strategy in Barbados has been centred on fiscal incentives legislation with an invitational and export orientation. Eligibility for incentives is dependent inter alia on depth of processing, exportability, value added and employment generation. This paper has tried to examine the extent to which the inducement to invest and the discriminatory application of incentives, has influenced profit variation in the manufcturing sector of Barbados. It was found that revenue growth in the manufacturing sector tended to increase with exportability, protection and to some extent the ratio of value added to output. However, the depth of processing seemed unimportant to either revenue growth or profit variation. Profit margins tended to increase with the level of value added, but not exportability or the depth of processing. One important finding is that profit margins vary directily with wage rates and labour intensity. This suggests that wages don't erode relative profit across activities, but high value added or profitability allows payment of high wages. This suggests the inclusion of the imput cost or input output variable in the profits function, particularly as small economies are viewed as price takers for both input and output. The foregoing seems to confirm the existence of a dual production structure among manufacturers. It appears that foreign invitational industry is concentrated in high export, high value-added producer goods, while indigenous

industry is concentrated in low export, low value-added non-durable consumer goods. Indigenous industry is now learning to produce durable consumer goods, but is doing so at a cost in terms of lower profit margins.

Regression analysis suggests that the conventional manufacturing profitability model based on an efficiency collusion thesis is inappropriate for small open developing economies. This is largely because the conventional model excludes input cost, infant industry and wage rate considerations. A significant finding is that protection and labour productivity do not matter . There are three main policy implications. Firstly, the protective strategy should reflect infant industry considerations. In this regard, infancy rates will give some indication of the relative industry requirement for additional incentives. Secondly, manufacturing planners should pay greater attention to product characteristics. Thirdly, the export orientation of local planners is vindicated when we consider that increased ability to export suggests improved infancy rates overtime.

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Table 1

Composition of Manufacturing Activities

Activity No.	Description as per National Accounts Aggregates
1	Meat processing
2	Poultry processing
3	Dairy products and fish processing
4	Fruit and vegetable processing; manufacture of vegetable and animal oils and fat; grain and feed mills; miscellaneous food processing
5	Manufacture of bakery products
6	Distilling and blending of spirits
7	Production of soft drinks and carbonated beverages
8	Manufacture of fermented beverages; tobacco processing
9	Manufacture of textiles other than wearing apparel; knitting mills; manufacture of leather and products of leather and leather substitutes
10	Manufacture of garments
11	Manufacture of wood and wood products other than furniture
12	Manufacture of furniture and fixtures other than metal
13	Manufacture of paper and paper products
14	Printing and publishing services
15	Manufacture of pharmaceuticals and toilet preparations
16	Manufacture of industrial chemicals and chemical N.E.C.; petroleum refining

Table 1 (Cont'd)

Composition of Manufacturing Activities

Activity No.	Description as per National Accounts Aggregates
17	Manufacture of non-metallic mineral products N.E.C.
18	Manufacture of metal furniture and allied products
19	Manufacture of structural products and building materials of metal
20	Manufacture and assembly of machinery and equipment except electrical
21	Manufacture and assembly of electrical machinery apparatus and appliances
22	Manufacture and assembly of transport equipment. Manufacture of metal and metal products N.E.C.
23	Manufacture of rubber and plastic products; manufacture of photographic and optical goods
24	Manufacture of jewelry, novelties and handicraft N.E.C.; other manufacturing N.E.C.

Table 2

Composition of Manufacturing Groups by Activity Numbers

		TOTAL
I.	**Product Group**	
	Non-durable consumer goods Nos. 1, 2, 3, 4, 5, 6, 7, 8, 10, 13, 15, 24	12
	Durable consumer goods Sector Nos. 12, 18	2
	Producer goods Nos. 9, 11, 14, 16, 17, 19, 20, 21, 22, 23,	10
II.	**Exportability**	
	Low Export Activities Nos. 11, 2, 3, 7, 14, 16, 24, 8, 17	9
	Moderate Export Activities Nos. 5, 18, 4, 13, 1, 22	6
	High Export Activity Nos. 21, 9, 10, 12, 19, 15, 23, 20, 6	9
III.	**Value Added**	
	Low Value Added Activities Nos. 1, 2, 3, 4, 11, 19, 16, 18	8
	Moderate Value Added Activities Nos. 5, 6, 7, 9, 10, 12, 13, 15, 17, 21, 22, 23, 24	13
	High Value Added Activities Nos. 8, 14, 20	3

Source: Central Bank of Barbados

Table 2 (Cont'd)

Composition of Manufacturing Groups by Activity Numbers

	TOTAL
IV. Wage Rate	
Low Wage Rate Activities Nos. 1, 2, 4, 5, 6, 7, 8, 9, 10	9
Moderage Wage Rate Activities Nos. 3, 11, 12, 13, 17, 21, 23, 24	8
High Wage Rate Activities Nos. 14, 15, 16, 18, 19, 20, 22	7
V. Labour Intensity	
Low Labour Output Ratio Activities Nos. 2, 4, 6, 11, 15, 16, 19, 23	8
Moderate Labour Output Ratio Activities Nos. 3, 5, 7, 8, 10, 13, 18, 24	8
High Labour Output Ratio Activities Nos. 1, 9, 12, 14, 17, 20, 21, 22	8

Table 3

Growth of Manufacturing: Exports and Sales, 1974-80

Activity Groups (See table 2)	Sales $ Million		Annual % Increase	Exports $ Million		Annual % Increase	Exports/Sales	
	1974	1980	1974-80	1974	1980	1974-80	1974	1980
Activity Groups	134.4	280.5	13.0	31.6	73.9	15.2	24	26
Non-durables Consumer	9.1	15.9	9.8	0.6	6.3	47.9	7	40
Producer Goods	96.9	266.5	18.4	24.7	92.8	24.7	25	35
Low Export	118.7	260.1	13.9	6.6	11.0	8.9	6	4
Moderate Export	48.3	108.0	14.4	6.8	15.0	14.1	14	19
High Export	73.4	194.8	17.7	43.5	147.0	22.5	59	75
Low value added	106.5	234.3	14.0	10.4	20.1	11.6	10	9
Moderate value added	112.4	274.9	16.1	45.2	148.4	21.9	40	54
High value added	21.5	53.7	16.5	1.3	4.5	23.0	6	8
Total Manufacturing	240.4	562.9	15.2	56.9	173.0	20.4	24	31

Source: Central Bank of Barbados

Table 5

Profit Variation by Activity Group 1974-80

(Weighted Averages)

Activity Groups	Profit $M		Annual %	Profit Contribution %		Profit Margins %	
	1974	1980	Increase	1974	1980	1974	1980
Non Durable Consumer	15.4	32.2	13.1	61.4	51.3	11.5	11.5
Durable Consumer	0.8	1.4	9.8	3.2	2.2	8.8	8.8
Producer Goods	8.9	29.2	21.9	35.5	46.5	9.2	11.0
Low Export	12.2	28.7	15.3	48.6	45.7	10.3	11.0
Moderate Export	3.3	7.1	13.6	13.2	11.3	6.8	6.6
High Export	9.5	27.1	19.1	37.8	43.2	12.9	13.9
Low Value Added	4.1	13.5	22.0	16.3	21.5	3.8	5.8
Moderate Value Added	16.0	37.7	15.4	63.7	60.0	14.2	13.7
High Value Added	5.0	11.7	15.2	19.9	18.6	23.3	21.8
TOTAL Manufacturing	25.1	62.9	16.5	100.0	100.0	10.4	11.2

Source: Central Bank of Barbados

Table 4

Weighted Averages of Selected Protection Measures

(Percentages)

Activity Groups	Nominal Protection				Effective Protection						Export Bias		Total No. of Activities 1974-80
					To Export		To Import Subst.		To Activity				
	1960	1966	1974	1980	1974	1980	1974	1980	1974	1980	1974	1980	
Non-durable consumer	40	42	76	67	20	21	173	259	152	218	126	164	12
Durable consumer	24	26	40	45	34	29	703	255	653	218	488	474	2
Producer consumer	12	14	20	29	9	13	71	331	52	260	59	40	10
Low Export	22	25	34	39	15	16	129	149	122	141	100	102	9
Moderate Export	13	14	18	23	22	24	219	720	201	630	155	250	6
High Export	47	48	100	87	14	9	146	147	98	75	107	57	9
Low value added	11	14	16	17	9	9	129	291	120	258	102	100	8
Moderate Export added	38	39	80	74	23	25	149	230	116	176	105	141	13
High value added	67	70	103	109	22	11	344	333	278	311	244	233	3
Overall Manufacturing	29	32	53	51	16	16	157	267	133	226	116	130	24

Source: Central Bank of Barbados

Table 5A

Profit Variation by Labour Activity, 1980

(Weighted Averages)

Activity Groups	(Hourly Wage) (Rate $)	$M Profits	$M Sales	Profit Margin
Low Wage Rate	2.79	26.72	247.9	10.8
Moderate Wage Rate	3.50	11.7	144.0	0.8
High Wage Rate	4.57	24.3	170.9	14.2
	(Labour/Output) (Ratio %)			
Low Labour Intensity	7.6	16.7	235.4	7.1
Moderate Labour Intensity	12.8	25.0	177.7	14.1
High Labour Intensity	24.1	21.7	149.7	14.5

Table 6

Industry Concentration Characteristics 1980

Activity	Size of Oligopoly*	No of Firms **	C3 %	DON %
1	1	3	1	.24
2	2	3	1	.33
3	2	2	1	.50
4	3	13	.81	.07
5	3	21	.83	.04
6	3	5	.78	.16
7	3	3	.99	.32
8	2	2	.99	.47
9	3	8	.33	.02
10	5	30	.45	.001
11	2	4	.68	.25
12	4	24	.48	.02
13	3	5	.89	.17
14	4	18	.65	.05
15	3	6	.91	.10
16	1	13	.95	.07
17	4	13	.61	.07
18	2	8	.99	.10
19	4	8	.80	.05
20	3	4	.83	.16
21	5	19	.47	0
22	3	7	.88	.12
23	4	9	.59	.07
24	2	15	.49	.06

* Oligopoly comprises firms whose sales are at least one-third that of the leading firm.

** Comprises firms responding to Government Survey of Establishments.

C3, DON = Three firms concentration and infancy concentration, respectively.

Source: Central Bank of Barbados and Government Statistical Department.

Table 7

Regression Results: The Determinants of Industry Profit Margins

EQUATIONS	1	1A	2	2A
DEPENDENT	LPCM	PCM	LPCM	PCM
KO	1.525 (2.615) **	0.128 (2.779) **	0.872 (5.265) **	0.096 (2.402) **
CAD	0.061 (0.180)	0.045 (1.761) *	0.553 (5.881) **	0.077 (2.977) **
C3	-0.122 (-0.125)	-0.007 (-0.095)		
G	0.167 (0.961)	0.012 (0.851)		
N	0.013 (0.500)	-0.001 (-0.424)		
DON			-1.421 (-5.478) **	-0.234 (-3.124) **
ICR			-2.864 (14.544) **	-0.281 (5.092) **
GX			-0.087 (6.603) **	-0.010 (2.873) **
WD			-0.316 (-6.714) **	-0.035 (-2.740) **
AR(1)		0.529 (2.640) **	-1.666 (-6.706) **	-0.648 (-3.874) **
AR(2)			-1.304 (-3.729) **	
AR(3)			-4.667 (-2.324) **	
R2	0.336	0.490	0.901	0.685
DW	1.738	1.821	2.136	2.486
F	1.824	2.559 *	11.169 **	4.653 **

(a) Results are based on 24 observations for 1980. The t values are in parentheses below each estimated coefficient. Statistical significance at levels 0.10 and 0.05 (two-tailed test) are denoted by * and ** respectively.

Table 8

Elasticity Coefficients for Equation 2

VARIABLE	MEAN	B	ELASTICITY
KO	0.2740	0.8722	3.183
CAD	0.5238	0.5530	1.055
DON	0.1118	-1.9207	-17.179
ICR	1.4392	-2.8637	-1.989
GX	2.5033	-0.0867	-0.034
WD	2.9714	-0.3163	-0.106

Table 9

Regression Results: Refining the Small Economy Model

EQUATIONS	2	3	4	5	6	7
DEPENDENT	LPCM	LPCM	LPCM	LPCM	LPCM	LPCM
KO	0.872 (5.265) **	1.103 (2.579) **	0.727 (1.581)	1.026 (2.400) **	0.885 (2.208) **	0.947 (1.893) *
CAD	0.553 (5.881) **	0.648 (2.289) **	0.493 (1.687)	0.610 (2.411) **	0.661 (-2.550) **	0.665 (2.579) **
DON	-1.421 (-5.478) **	(-1.303) (1.811) *		-2.387 (-3.120) **	-2.150 (-2.850) **	-2.123 (-2.769) **
C3			-0.694 (1.388)			
G		0.194 (1.558)				
GX	-0.087 (-6.603) **		-0.046 (-1.231)	-0.065 (-1.855) *	-0.073 (-2.100) *	-0.067 (-1.421)
WD	-0.316 (-6.714) **	-0.247 (-1.740) *	-0.404 (-2.677) **			-0.285 (-1.942) *
WR				0.197 (1.997) *		
ICR	-2.864 (-14.544) **	-2.204 (-3.844) **	-2.577 (-4.123) **	-2.078 (-4.075) **	-2.614 (-4.764) **	-2.600 (-4.761) **
VE					-0.016	
T						-0.059 (-0.218)
AR(1)	-1.666 (-6.706) **	-0.404 (-2.093) *	-0.541 (-3.146) **	-0.474 (-2.665) **	-0.562 (-3.473) **	-0.548 (-3.109) **
R2	0.901	0.656	0.579	0.679	0.699	0.699
DW	2.136	2.344	2.543	2.634	2.94	2.93
F	11.169 **	4.091 **	2.943 **	4.538 **	4.057 **	4.076 **

Appendix

Profit Variations - Variables

ACTI-VITY	PCM %	CAD	N	IO %	C3 %	G %	GX %	T %	DON %	WR $	WD $	VE $M
1	0.02	1.00	3.00	0.65	1.0	2.29	2.56	0.13	0.24	3.13	3.38	0.01
2	0.10	1.00	3.00	0.76	1.0	2.41	2.42	0.12	0.33	3.13	3.38	0.01
3	0.07	1.00	2.00	0.68	1.0	1.17	.15	0.24	0.50	3.20	3.28	0.01
4	0.04	1.00	13.00	0.84	.81	2.44	1.76	0.15	0.07	3.13	3.38	0.09
5	0.09	1.00	21.0	0.70	.83	1.85	8.02	0.40	0.04	3.09	3.43	0.01
6	0.05	1.00	5.00	0.69	.78	1.15	.70	2.45	0.16	2.97	3.61	0.01
7	0.14	1.00	3.00	0.59	.99	1.95	7.80	0.30	0.32	2.97	3.61	0.01
8	0.23	1.00	2.00	0.42	.99	2.39	2.39	1.89	0.47	2.89	4.36	0.02
9	0.14	0.00	8.00	0.53	.33	2.47	2.63	0.40	0.02	1.92	4.03	0.01
10	0.14	1.00	30.0	0.63	.45	2.73	2.98	0.45	0.00	1.92	3.75	0.01
11	0.02	0.00	4.00	0.84	.68	1.64	0.0	0.25	0.25	3.55	2.69	0.01
12	0.08	1.00	24.0	0.68	.48	1.30	13.86	0.45	0.02	3.55	2.09	0.01
13	0.15	1.00	5.00	0.65	.89	1.43	.93	0.25	0.17	3.55	3.42	0.02
14	0.22	0.00	18.0	0.40	.65	2.69	1.35	0.15	0.05	4.46	2.38	0.01
15	0.27	1.00	6.0	0.59	.91	3.21	2.65	0.35	0.10	4.51	2.68	0.02
16	0.06	0.00	13.0	0.62	.95	2.32	2.32	0.20	0.07	4.90	2.76	0.12
17	0.11	0.00	13.0	0.61	.61	3.01	3.61	0.25	0.07	3.55	3.23	0.01
18	0.09	1.00	8.00	0.73	.99	2.78	5.15	0.45	0.10	4.53	1.42	0.01
19	0.08	0.00	8.00	0.80	.80	3.34	5.09	0.20	0.05	4.53	2.29	0.02
20	0.14	0.00	4.00	0.45	.83	2.33	14.37	0.10	0.16	4.53	2.53	0.01
21	0.15	0.00	19.0	0.60	.47	5.74	6.11	0.30	0.00	3.52	2.86	0.01
22	0.17	0.00	7.00	0.47	.88	2.60	1.70	0.30	0.12	4.53	3.13	0.02
23	0.20	0.00	9.00	0.56	.59	2.28	1.37	0.30	0.07	3.55	2.67	0.02
24	0.16	1.00	15.0	0.66	.49	2.15	2.46	0.45	0.06	3.55	2.08	0.01

Notes to Appendix

VARIABLE	DESCRIPTION
PCM	Price cost margin = value added minus payroll as a proportion of sales. Derived from the National Accounts of Barbados at producer prices.
CAD	Consumer Advertising Dummy = unity for consumer goods and zero otherwise.
N	Number of firms = size of sample of firms responding to survey of establishments carried out by Barbados Statistical Service.
IO	Input Output Coefficient = ratio of intermediate inputs to sales. Derived from National Accounts of Barbados at producer prices.
ICR	Input Cost Ratio = ratio of intermediate inputs to wages plus intermediate inputs. Derived from the National Accounts of Barbados at producer prices.
C3	Three Firm Concentration Index = sales of top three firms as a proportion of total sales of activity. Derived from the National Accounts of Barbados at producer prices.
DON	Infancy Concentration Index = the proportion of domestic sales in total activity sales divided by the number of firms in activity. Derived from the National Accounts of Barbados and the Government Establishments Survey.
G	Growth Rate = sales in 1980 divided by sales in 1974. Derived from the National Accounts at producer prices.
GX	Export Growth Rate = export in 1980 divided by exports in 1974. Source: Central Bank of Barbados.
T	Tariff Protection = tariff rate on final products of activity. Source: The Barbados Customs Tariff.
WR	Wage Rate = average wage rate for non managerial employees. Source: The Barbados Labour Department.

WD	Wage Rate Differential = dollar difference between hourly non-managerial wage rates in Barbados and the US. Sources: The Barbados Labour Department, The (US) Survey of Current Business and the (US) Economic Report(s) of the President.
VE	Labour Productivity = dollar value added per employee. Employment was derived from wage rates and the value of labour payments. Source: The Central Bank of Barbados.