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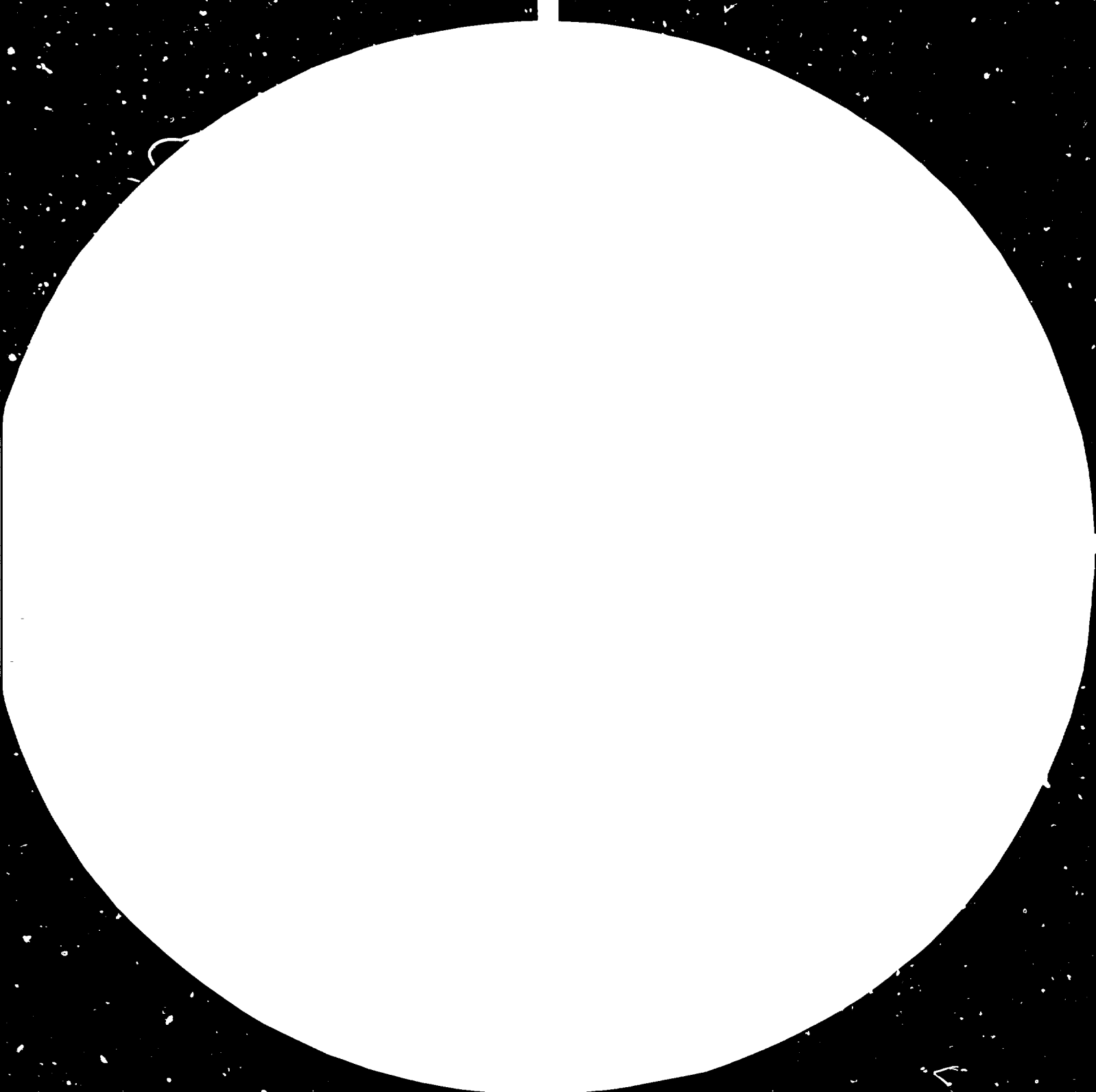

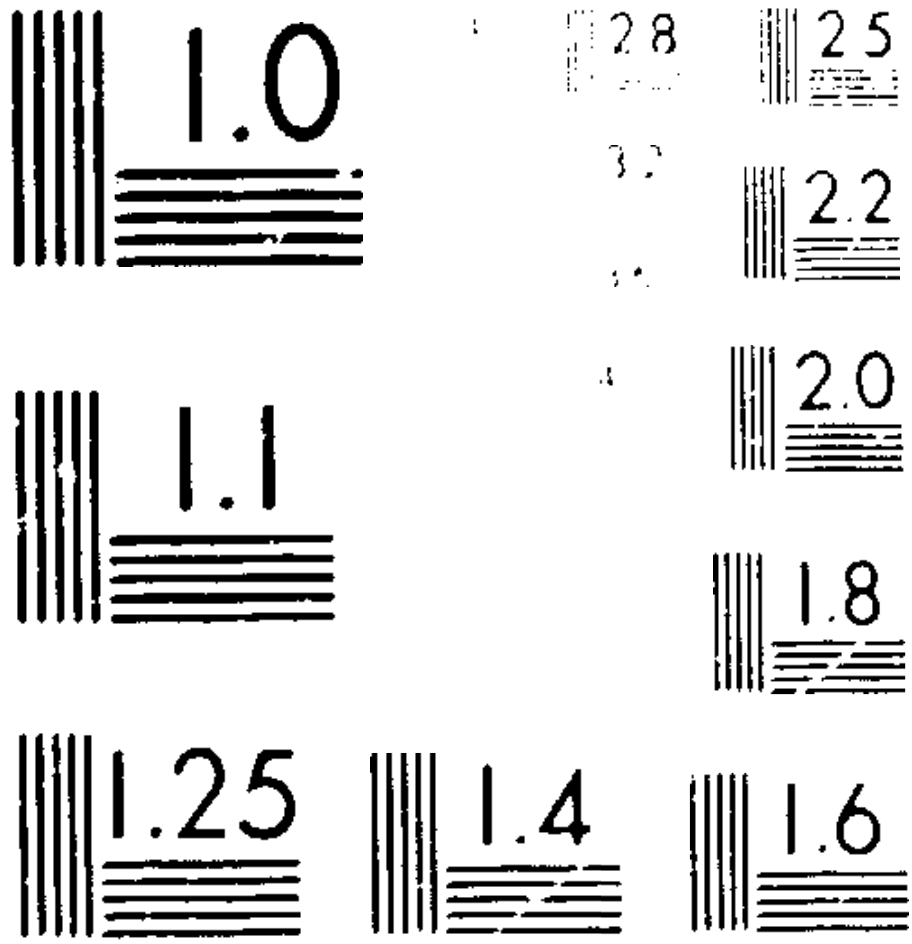
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COMPARATIVE STUDY OF IMPACT OF PUBLIC AND PRIVATE MANUFACTURING SECTORS IN SELECTED DEVELOPING COUNTRIES*

by

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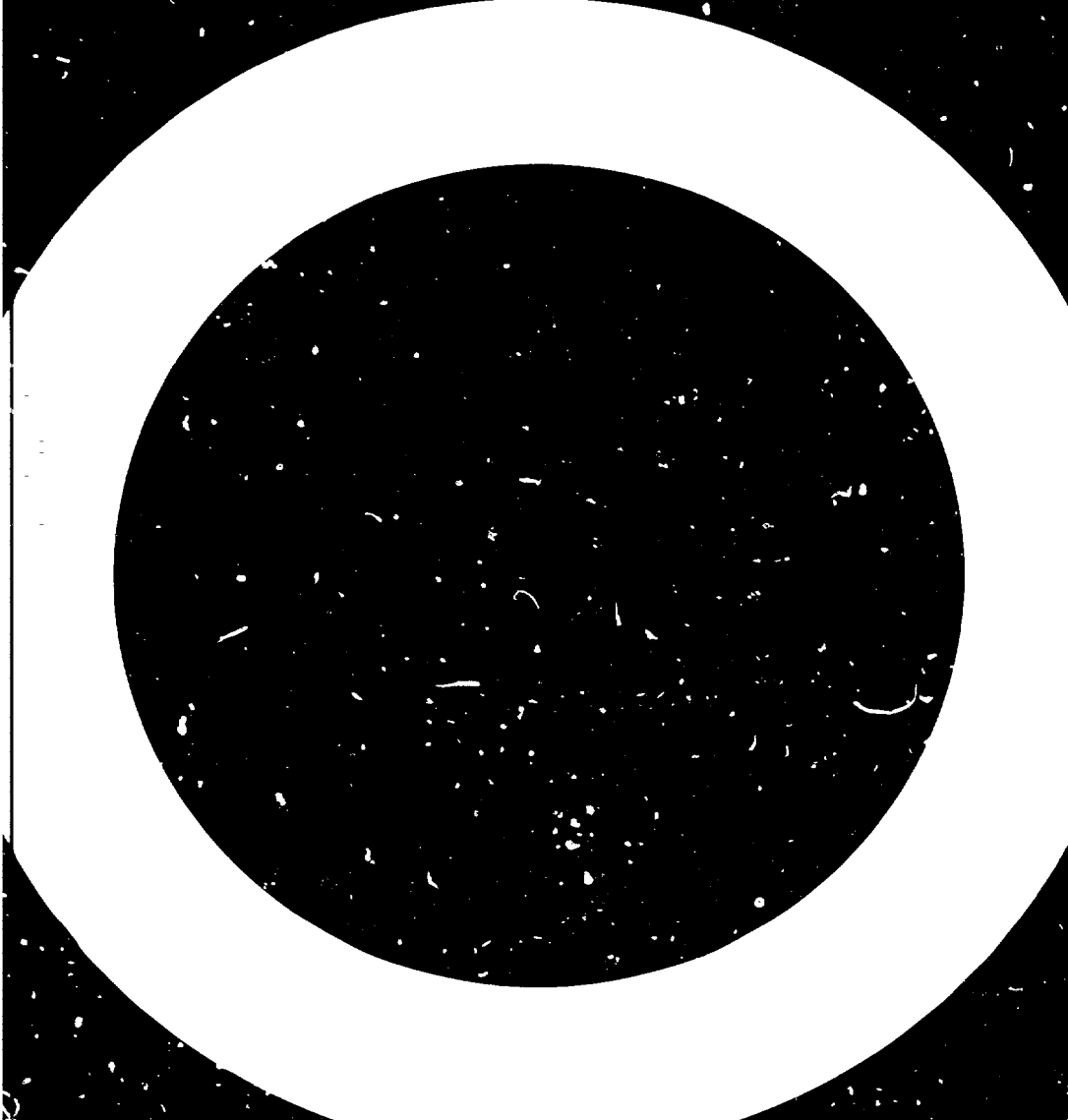

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Preface

This study has been undertaken by Mr. Javed Ansari as consultant to UNIDO. It attempts to compare the impact of public and private manufacturing enterprises on national development in selected developing countries and to analyse the investment behaviour of these enterprises. The study was initiated in response to a suggestion made by the Industrial Development Board at its fourteenth session to study the role of the public industrial sector in relation to other sectors. An attempt has been made to collect as much statistical information from developing countries as feasible. However, both the quantity and quality of the data base has imposed limitation on the scope of the study. The empirical work presented in this paper is of a preliminary nature and may be further refined. It is hoped that the analysis will permit an appreciation of the similarities and differences in performance and behaviour of public and private manufacturing enterprises in developing countries.

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SUMMARY

The study concentrates on anlayzing the impact of public and private manufacturing enterprises in selected developing countries. The sample varies in accordance with data availability. Following are its main findings:

The growth of both public and private manufacturing investment has had a positive impact on the growth of per capita income in developing countries. Public manufacturing enterprises have played an important role in initiating and sustaining resource based industrialization strategies. They have been the source of large scale investment in modern, relatively capital intensive industrial branches. Such investment could not have been obtained from private domestic or foreign enterprises due to risks or uncertain production conditions. Public manufacturing firms have had an impact on the process of industrial restructuring in developing countries where resource-based or heavy industries have grown relatively rapidly.

Private manufacturing enterprises have generated a relatively high rate of savings. In most developing countries public manufacturing enterprises have been net borrowers. Resources mobilized for investment by these firms have been relatively modest. They have tended to employ relatively capital intensive technology of production. No generalization can be made as far as employment generation is concerned however. The overall finding seems to be that in some developing countries the employment impact of public and private manufacturing investment is broadly similar. The major exception is Pakistan where private manufacturing's employment performance is clearly superior.

As far as foreign trade performance is concerned data was available for only three countries: Syria, Iraq and Mexico. The range of experience is too varied to permit any generalization. In Syria the private firms are seen to be more successful in terms of both import substitution and export promotion. In Iraq private firms have made a greater impact on import substitution but there is little to distinguish between public and private firms as far as export performance is concerned. In Mexico the export performance of the public manufacturing sector is clearly superior.

An important finding which emerges from the analysis is the significance of industry-specific characteristics in determining enterprise behavior. It is clear for example that differences in technology employed by public and private firms is explained largely by the fact that public firms are more concentrated in the capital-intensive industries. Comparison of public and private behaviour are likely to be most meaningful when firm samples are drawn from similar industrial branches. It has not been possible to do this in the present study.

The micro part of the study was concerned with an analysis of enterprise level data for two countries only - India and Pakistan. Both public and private firms had a modest negative impact on the level of industrial concentration in the case of India. In Pakistan concentration within the private industrial sector increased rapidly. The growth of public sector firms on the other hand had a smaller impact on concentration in Pakistan.

The investment behaviour of public firms is explained in both India and Pakistan is explained by the "capacity utilization" models. Domestic demand conditions were thus seen to be important determinants of investment expansion of public firms. In the case of domestic private sector firms profitability was an important short run constraint on investment growth. This was not the case for the sample of Indian subsidiaries. Here investment behaviour was once again best explained by the capacity utilization models. Moreover, in the case of both public firms and subsidiaries profitability levels were not related to either size or growth. Thus there was reason to expect the existence of important similarities in the behaviour of public firms and subsidiaries.[1/]

This led us to explore possibilities for co-operation between public firms and TNC subsidiaries. Attention was concentrated on developments within the petrochemical industry. It was found that prospects for such co-operation were most pronounced when investment programmes were developed in response to expanding domestic demand, but important (though not unsurmountable) barriers impeded the growth of such co-operation when investment was undertaken with view to expanding exports.

1/ Financing patterns were found to differ, however

INTRODUCTION

This paper attempts to compare the impact of public and private manufacturing enterprises on national development in the developing countries and to analyse the investment behaviour of these enterprises. The first part of the paper addresses the question of assessing the development impact of public and private sector manufacturing investment at a macro level. The experience of the following developing countries is analysed: Bangladesh, Egypt, India, Iraq, Mexico, Pakistan, Syria, and Thailand. An attempt has been made to include data from as many developing countries as possible, in order to construct a picture which can include a wide range of diverse experiences. Reference has therefore been made at appropriate points to Brazil, Malaysia, People's Democratic Republic of the Yemen and Sri Lanka for which only frequentary evidence was available.

The second part of the paper uses firm level data to investigate the determinants of public and private sector enterprise investment and profitability. Financial accounts were available for India for the period 1972-1979, and for Pakistan for the period 1972-1977.

It is hoped that this empirical work will permit an appreciation of similarities and differences in the operational performance of public and private manufacturing enterprises in developing countries. An assessment can then be made of the potential for co-operation between public and private manufacturing enterprises in order to accelerate the pace of industrial development. This question is addressed in the final section of this paper.

I. IMPACT OF THE PUBLIC AND PRIVATE MANUFACTURING SECTOR ON DEVELOPMENT

Impact on growth and structural change

The impact of public and private sector expansion on growth depends first of all on the relative weight of the two sectors within the national economy. Public manufacturing enterprises account for a relatively high proportion of gross output and value added in Bangladesh, Egypt, India, Iraq, Syria and Yugoslavia among the countries included in the present sample. In Malaysia, Mexico, Pakistan and Thailand the private enterprises dominate the manufacturing sector.

Public industrial enterprises tend to be concentrated in the intermediate goods branches. This trend is most clearly marked in the case of petroleum refining. This points to the fact that "resource-based" industrialization strategies are particularly dependant upon effective government intervention in commodity and factor markets. This is so whether the policy is export or domestic-demand oriented. Mexico is a good example of a developing country seeking resource-based industrialization which is in the process of switching from a domestic demand-based to an export-oriented strategy. It is unlikely that the pivotal role of state enterprises - particularly Petromas - within the economy will be called into question in the foreseeable future.

The share of public sector enterprises within the heavy industrial branches is pronounced in the case of some developing countries. In others such as Mexico where public enterprises produce over 20 per cent of

the output of the metal products industry, and in the transport industry the share of the public sector in the output of the heavy industries was rising. In 1969 the share of public enterprise in the machinery producing branch and in the transport subsector had been relatively modest. There is thus some evidence that an emphasis on heavy industrialization usually entails an expansion of public sector enterprise.

In some countries such as India and Mexico the state sector plays a relatively insignificant role in the production of consumer goods - the exception here is tobacco production in Mexico. In Iraq on the other hand the public enterprise sector accounted for over 70 per cent of value added in the beverages, tobacco, and textile industries in 1975, but the share of the public sector in value added of the food manufacturing branch had descreased. Consumer goods industries are thus seen as primarily the domaine of private enterprise and concern with the provision of basic needs has not, during the 1970's, led to a major expansion of public enterprises in these branches.

The expansion of public investment particularly within the manufacturing sector is often related to the desire to achieve preference re-ordening within developing economies. In such a case public production is concentrated initially in industrial branches which have little weight within the structure of manufacturing production. With the passage of time public sector investment is expected to make a contribution towards increasing the relative importance of these industrial branches. For four countries included within the present

sample it has been possible to estimate the impact of public manufacturing investment on industrial restructing. Table 1 reports the results of an exercise in which ISIC 3 digit level industrial branches were ranked in accordance with their level of public investment in the year 1970, (1972 in the case of India and Pakistan). These branches were again ranked in accordance with their share in industrial production or value added at a later time period. Spearman's correlation coefficient[1/] was then calculated for the two rankings.

Table 1. Industrial branches ranked by share of public sector investment and by share of industrial output or value added India, Iraq, Mexico, Pakistan

Country	Date of investment ranking	Output or value added Date of ranking	Value of rs
Mexico	1970	1975 (output)	0.76
Iraq	1970	1975 (value added)	0.86
India	1972	1976/7 (output)	0.17
Pakistan	1972	1974/75 (value added)	0.06

From this table we see that the value of Spearmans correlation coefficient for Iraq and Mexico is high: but for Pakistan and India it is relatively low. In the latter two countries the public industrial sector has not been a major vehicle for the achievement of industrial restructing. In these countries the public enterprises remain concentrated in the resource processing and the heavy engineering sector, whereas a consistently high proportion of manufacturing output and value added continues to originate in the light consumer goods industries, particularly food processing and textiles. In the case of Iraq and Mexico the public sector's share in the light industries is considerably higher than in India or Pakistan. In Mexico this share is rising rapidly

- the share of public enterprises in value added in the food processing industries' increased by 98 per cent over the period 1965-75. Such a trend is not evident in the case of Iraq, and this fact perhaps partly explains the reduction in the concordance of industries ranked by share in total output and by share in the output of the public manufacturing sector in Iraq. The value of r_s for Iraq industries ranked by share in total output on the one hand and share in public manufacturing output on the other declined from 0.99 to 0.82 over the period 1970-75[2/]. This has implications for the distribution of intra-industrial growth rates which will be explored below.

Growth of public sector production in the manufacturing sector of most countries in the sample has been rapid. In Table 2 we present estimates of annual average growth of public industrial output for a sample of developing countries. It is to be emphasized that this table does not provide an adequate basis for inter country comparisons of public sector growth within the manufacturing sector. The output growth rates for Mexico and Egypt and value added growth rates for Mexico, Pakistan and Thailand are calculated in current prices. Given the large differences in the dispersion of national inflation rates this makes a comparison between these countries and others included in the sample virtually meaningless.

As far as the output data is concerned we can legitimately compare only Sri Lanka, Yemen and India (1967-76) for which we have growth estimates based on constant prices for roughly similar time periods. For the value added data we can compare Bangladesh, Yugoslavia (1970-77),

Iraq and Sri Lanka (1970-74). But for both these series there are differences in the base years from which the constant price growth rates have been estimated for the different countries. This is once again a serious limitation on international comparability.

Given these difficulties it is surprising to note the relatively modest dispersion of value added growth rates estimated at constant prices. For the 4 countries for which this type of data was available average annual growth rates of public industrial value added was 19.55 per cent with a standard deviation of 5.45 per cent. This gives a coefficient of dispersion value of 0.27 for the constant prices output data. The value of the coefficent of dispersion for value added by public enterprises of all countries in the sample (i.e. ignoring differences in methods of computation of growth rates and time periods) is 1.06 - almost four times the value of the coefficent of dispersion of the sample of countries whose public sector value added growth rates have been calculated at constant prices. This makes it possible for us to hope that ignoring differences in the time series base for calculating value added growth rates at constant prices does not constitute a major hinderance to comparing public sector performance in these countries.

Relatively similar levels of public sector value added growth in Bangladesh, Iraq, Yugoslavia and Sri Lanka may be explained to a significant extent by the nature of the regime that ruled these countries during the period under study. The Awame League, the Yugoslav Communist Party, the Iraqi Arab Ba'ath Party and the United Left Front which governed Sri Lanka during 1970-74 all had a commitment to populist

Table 2. Annual average growth of public industrial output and Value Added, various years

(Percentage)

Country	Years	Output	Years	Value added
Thailand			1969-1973	49.53[a/]
Pakistan			1961-1975	197.04[a/]
			1970-1975	170.16[a/]
Mexico	1965-1975	38.85[a/]	1965-1975	61.31[a/]
	1970-1975	24.44[a/]	1970-1975	41.71[a/]
Bangladesh	1972-1978	9.12[b/]	1972-1978	15.80[c/]
Jugoslavia	1961-1970	6.30[d/]	1960-1977	25.09[e/]
	1971-1975	5.90[d/]	1970-1977	13.81[e/]
	1976-1978	6.20[d/]		
Iraq			1970-1976	27.98[f/]
Sri Lanka	1969-1978	16.22[g/]	1961-1966	13.40[h/]
	1973-1978	2.77[g/]	1966-1970	27.40[h/]
			1970-1974	20.00[h/]
			1966-1974	23.00[h/]
India	1967-1976	4.42[i/]	1961-1973	12.00[i/]
	1960-1976	5.25[i/]		
Egypt	1973-1974	2.60[k/]		
	1974-1975	8.10[k/]		
Korea[l/] Republic of			1963-1972	64.32
South Yemen	1974-1979	21.00[m/]		

Note: (a) at current prices

(b) estimated from products on index (1972-73 = 100) for public enterprises in 32 product areas.

(c) at constant factor cost in 1972/73 prices.

(d) method of calculation not specified.

(e) constant prices 1972.

(f) growth rate of industrial branches with more than 50 per cent public sector participation in value added in 1975. At constant factor costs 1970.

(g) at constant 1960 prices.

(h) at constant 1960 prices

(j) constant 1970 prices.

(k) at constant 1969 prices.

(l) current prices.

(m) at constant 1970 prices.

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socialism and all placed emphasis upon the need to expand the role of public enterprise. It is generally argued that ideological orientation does not account for different relative sizes of the public sector. Thus Jones has found that "Korea which approximates zero on the rhetoric of socialism scale has a public enterprise sector which on the basis of value added outside agriculture, forestry and fishing is quite similar to India despite substantial socialist advocacy in the (latter) country"[3/]. The data in Table 2 does not allow us to test this hypothesis with any measure of rigour.

An anlaysis of the relationship between public sector industrial growth and the growth performance of the economy can be approached in a variety of ways. First, an attempt was made to evaluate the impact of income growth on public manufacturing investment.[4/] Single equation regression models were applied to two sets of data. The first sample consisted of 19 developing countries - Argentina, Brazil, Colombia, Bangladesh, Mexico, Pakistan, Iraq, Syria, Jordan, Peru, Tanzania, Sri Lanka, Malaysia, Egypt, Democratic Republic of Yemen, Republic of Korea, Thailand, India and Yugoslavia. The second sample consists of the afore mentioned countries and 15 developed market economy countries for which data was available. Results obtained suggested that public manufacturing investment as a ratio of GDP rose rapidly for the developing countries - the regression coefficient estimates for both the independant variables of the equation were postive. In the second sample the regression coefficient estimate for the log of income per capita squared was negative. This indicated that beyond a certain level of per capita income public manufacturing investment as a ratio of GDP tended to

decline. This second result is consistent with that obtained by Chenery and Syriquin for the share of investment in GDP for a large number of developing and developed countries. Our first result suggests that the developing countries for which we had data have not yet reached an income per capita level at which the share of public manufacturing investment as a ratio of GDP would begin to decline.

A similar quadratic equation was also fitted to the two sets of data using private manufacturing investment as a share of GDP as the dependant variable. Once again positive regression coefficient estimates were obtained for both independant variables in the developing country data set and a negative regression coefficient was obtained for the log of the squared income per capita variable. This would suggest that there is no discernable significant difference in the response of public and private manufacturing investment to variations in the level of income per capita for countries in the present sample.

The next step in the analysis was to investigate the impact of the growth of public and private manufacturing investment on the growth of income per capita in developing countries. Pioneering work on the relationship between foreign private investment and the rate of growth of income has been done by Bornischer [5/] and Dolan and Tomlen.[6/] Following Bornischer we regressed the growth of income per capita on public manufacturing investment and on the level of logged income per capita at the beginning of the period. The period selected was 1964-1976 for which data was available for the 19 developing countries listed above. Another equation was regressed in which the dependant variable

was the same but private manufacturing investment was one independant variable and the level of logged income per capita was the other. The regression coefficients of both the public manufacturing investment variable and the private manufacturing investment variable are positive and significant. A similar effect has been noted by Bornischer in the case of foreign private investment [7/]. Our inability to obtain comparable estimates of the level of public manufacturing capital stock in the countries of our sample made it impossible to ascertain as to whether the "decapitalization thesis" which seemed to explain the impact of foreign investment accumalation on growth in developing countries also provides a basis for analysis of the long term impact of public manufacturing investment on the growth of national income.

The aggregate level at which the inquiry has been conducted so far has not proved particularly useful for identifying the role of public manufacturing investment in the process of industrial restructuring. In some countries such as Iraq and Mexico there is a close correspondence between the structure of public sector investment and the evolution of the manufacturing sector. In particular public sector initiative within the petrochemical sector have had a pronounced impact on the structure of industrial output in these countries. Thus the share of the Mexican petrochemical sector in total industrial value added increased by 56 per cent over the period 1965-1975. It is very difficult to believe that either local firms or transnational corporations would have been willing to invest on such a gigantic scale within this sector without substantial infra-structural and macro-economic support. It is thus evident that the

public sector has played an important role in accelerating the pace of structural transformation in these countries. Whether this role will continue is at this point an unsettled question. In the case of Iraq there has been a decline in the public sector's share of manufacturing output over the period 1970-1975. In the case of Mexico there is increasing encouragement to private sector enterprises for entry into the petrochemical industry on the one hand, and on the other the state enterprises have significantly increased investment in the lighter consumer goods industries. This may indicate a reorientation of public sector initiative for regulating structural change within the manufacturing sector.

In contrast to Mexico and Iraq, Indian and Pakistani public sector initiatives have not had a significant impact on the restructuring of industrial output. There is no significant correspondence between the inter industrial distribution of public sector investment and the inter industrial distribution of output or value added. In both countries until the middle 1970s public sector investment had remained concentrated in heavy capital and intermediate goods sectors. Yet over the period 1971 to 1977 the share of heavy industries (including petrochemical, non-metallic minerals, basic metals, metal products, machinery and transport equipment, and accounting for over 90 per cent of public manufacturing value added in 1976/1977) in India rose from only 38 per cent to 41.5 per cent and in Pakistan the share of these industrial branches in value added actually declined from 18.5 per cent in 1970/1971 to 15.4 per cent in 1974/1975. This - among other factors - was an

important reason for inducing the Government to enter the consumer goods producing sector through a large nationalization programme in 1975 and 1976.

In order to develop a more comprehensive picture of the impact of public and private manufacturing investment on national development it is necessary to take a detailed look at respective policies of resource mobilization and resource utilization. This is attempted in the next section of this paper.

Impact on resource mobilization and resource utilization

Analysts have placed some emphasis on the role of public manufacturing enterprises as an instrument of resource mobilization. An attempt is therefore made to present estimates of public sector saving in some developing countries. Estimates of aggregate saving - and the decomposition of this aggregate by sectors such as "households", "corporate", "public", etc. - are subject to large margins of error particularly in developing countries with large informal and semi monetized sectors. Moreover any attempt at arriving at realistic estimates of the public sector's contribution to gross domestic savings must be based upon a careful study of a country's flow of funds tables which identifies the main sources of saving and investment. No flow of funds tables were available at the time the study was undertaken. In order for an in depth analysis of the public sector's role in domestic resource mobilization it is essential that these tables be obtained and consistent definitions for disaggregating national sources of saving and investment be developed.

Table 3. Manufacturing public enterprise's share in national saving. selected developing countries

Country	Period	Share of public manufacturing enterprise in national saving
Bangladesh	1973-1974	1.00 per cent
India	1970-1971 to 1975-1976	1.74[b/] per cent
Pakistan	1965-1966 to 1974-1975	0.69[a/] per cent
Sri Lanka	1974	4.89 per cent
Thailand	1972	0.94 per cent

Sources: Il Sakong, Macro Economic Aspects of Public Enterprises in Asia, Korean Development Institute, Seoul, 1979.

Syed, R. H. Role and Performance of Public Enterprises in Pakistan, Investmeut Advisory Centre of Pakistan, Karachi: 1980 Government of Pakistan. Pakistan Economic survey 1977-1978, Islamabad, 1978.

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Note: a/ arithmatic average standard devition = 0.81

b/ arithmatic average standard deviation = 1.59

The importance of this second requirement is clearly borne out by Jones study. He used the Bank of Korea's Flow of Funds Accounts for the period 1963-1972, to estimate the public sector's contribution in national saving and investment. Depending on the definition of "public sector" employed the allocation of foreign transfers, the treatment of depreciation funds, etc. the share of Government in national savings ranged from 28 per cent to 9 per cent and that of "individuals" from 40 per cent to 17 per cent for the year 1972.[8/] It is therefore essential to agree on consistent and economically meaningful definitions and classifications for disaggregating national flow of funds estimates.

Estimates on the public manufacturing sector's contribution to national saving were obtained for India, Pakistan, Sri Lanka, Thailand, Bangladesh, Syria, Iraq and Mexico. Figures obtained for Bangladesh, India, Pakistan, Sri Lanka and Thailand are roughly comparable. These are reported in Table 3. It is evident that the manufacturing public enterprise sector is not an important national source of resource mobilization. Moreover for all the countries included in Table 3, the public manufacturing enterprise sector's share in gross fixed capital formation is relatively high. This means that the sector is a large net borrower within the domestic economy.

It is also possible to compare estimates of public and private manufacturing enterprise sector savings for India, Iraq, Syria and Mexico. In the case of India over the period 1970-1971 to 1977-1978, government non-financial companies and statutory corporations recorded

an annual average dis-saving of the order of Rs 440 million. As against this the private non-financial corporate sector had annual savings of about Rs 3050 million. Obviously, average profitability in private enterprises in India was considerably higher than average profitability of public manufacturing enterprises. Gross domestic capital formation in the public manufacturing enterprise sector averaged about Rs 110 million annually throughout this period.[9/]

In the case of Syria, estimates of the contribution of the public sector to national resource mobilization could not be obtained. Investment by public manufacturing enterprises grew at a modest rate of 4.92 per cent over the period 1968-1973. Over the period 1973-1977, however, the growth rate was an astonishing 80 per cent. Private manufacturing investment, which had grown at an annual rate of 58 per cent in the first period, contracted significantly during the second, with the result that its share in aggregate manufacturing investment declined from an average of 18.6 per cent during 1968-1973 to only 4.8 per cent during 1973-1977. Such a dramatic shift in emphasis was accounted for both by the reconstruction made imperative by the Ramadhan War and the general disillusionment with private investors and their alleged involvement in illegal practices - that characterized Ba'athist policy during the mid-1970s. It is clear that in the period 1973-1977 the public manufacturing sector was a large net borrower. Its surplus generating performance in this period and during 1968-1973 could not be ascertained.[10/]

Iraq also has placed considerable emphasis on public sector investment within the manufacturing sector. Estimates of public and private manufacturing investments in Iraq over the period 1960-1975 suggest that a clear distinction should be made between three periods: 1960-65 when public manufacturing investment grew rapidly and private sector investment grew at a much more modest pace; 1965-70 when private manufacturing grew rapidly but public investment in the manufacturing sector stagnated; and 1970-75 when public manufacturing investment skyrocketed and there was a significant cutback in private investment. Two factors seem to be the main determinants of the increase in public investment: the nature of the Iraqi regime and the rise in the price of oil. Public manufacturing investment grew rapidly in the days of Abdel Kassim but fluctuated widely during the period of relative political uncertainty i.e. 1963-70 when there were two revolutions led by different wings of the Ba'ath Party. During this period there was an increase in public manufacturing investment of 59 per cent in 1964-65 but a reduction of 36 per cent the next year for instance). It is interesting to note that private sector manufacturing investment grew most rapidly during the period of policitical uncertainty and actually declined during 1970-75 when oil prices rose rapidly and the pace of public manufacturing investment accelerated dramatically. There is some evidence here of a shift of resources and hence of investment capacity from the private to the public manufacturing sector.

How much of the investment growth in the manufacturing sector was due to resources mobilization within this sector can be partially estimated by looking at estimates of profits in Iraqi manufacturing - a breakdown by public and private enterprises is not available. In terms of gross profits, i.e. value added minus wage payments, total sectoral resource mobilization consistently exceeded sectoral investment until 1974. In 1975 there was a small deficit of approximately ID 6 million. In terms of net profits, i.e. gross profits minus depreciation charges, the deficit appeared in 1974 and was larger in 1975 (ID 19 million in 1974, ID 36 million in 1975). Until 1973, retained profits had continued to exceed sectoral investment by an average of about 27 per cent over the period 1970-73. By 1975, however, total manufacturing investment exceeded retained profits by a factor of two. It thus seems clear that whereas during the 1960s the investment programme in the manufacturing sector was largely self-financing, the expansion since 1973 was increasingly financed by outside sources, primarily petroleum earnings. This tendency is likely to be particularly marked for the public manufacturing sector. As Table 4 shows, however, non-wage value added is significantly higher in the public sector-dominated industries (i.e. industries with a public sector exceeding 40 per cent of value added), and the higher investment may thus be accompanied by higher rates of surplus generation. How much of this mobilization is due to enterprise efficiency and how much of it is accounted for by government intervention in input and output markets is a question we cannot answer on the basis of available information.[11/]

In the case of Mexico, estimates of the sources of public sector investment are provided by Villareal.[12/] Internally-mobilized resources provide about 28.5 per cent of total investable funds for Mexican public enterprises over the period 1940-1976. The value of the standard deviation of this figure is remarkably low (5.9 per cent for such an extended period). It may be concluded that the ability to mobilize resources has not increased greatly in the Mexican public sector. It is advisable not to read too much into these figures however. Villareal does not provide us with a precise definition of the concept "own resources". Varying this definition may substantially alter our estimate of the public sector's contribution to resources mobilization. Villareal cites evidence to show that there is no significant difference in the incidence of loss between public and private enterprises in Mexico; but he does not attempt to estimate relative levels of corporate profitability. He believes that public enterprises are becoming increasingly dependent on sources of external credit for financing their investment programmes.

The type of data available precluded the use of sophisticated econometric techniques for identifying the determinants of resource mobilization. Following Bornischer's methodology an attempt was made to estimate the impact of public and private sector industrial investment on the rate of growth of total fixed capital formation. This does not involve a statistical tautology. Though total fixed capital formation includes public and private sector industrial investment,

Table 4. Rates of Profit of Public and Private Manufacturing Enterprises in Iraq, 1970 and 1975

(in Iraqi Dinars at current prices)

Profit per Employee

1970				1975			
Public Manufacturing		Private Manufacturing		Public Manufacturing		Private Manufacturing	
Food	534	Beverage	268	Beverage	1,074	Food	435
Tobacco	630	Clothing	100	Tobacco	1,796	Clothing	460
Textile	177	Wood	45	Textile	247	Wood	100
Chemical	431	Paper	342	Paper	174	Leather	440
Petroleum	4,937	Leather	316	Printing	-39	Rubber	584
Non-metallic	333	Rubber	711	Chemical	741	Metallic	791
Transport	8,847	Metallic	133	Petroleum	3,760	Machinery	284
		Machinery	444	Non-metallic	236		
				Transport	4,345		

Source: UNIDO, Op. Cit., Page 91 and 186

we measure the former as an average annual growth rate and the latter as investment by public and private industrial corporations at different time periods. Nineteen developing countries listed previously were included in the sample. On the basis of the results obtained it is legitimate to conclude that the impact of public and private sector manufacturing investment on the growth of gross domestic capital formation (GDCF) is similar to that of its impact on the growth of per capita income. Indeed it is likely that the impact on income per capita is an effect of the impact on GDCF. Given the form of the estimating equation, it is not advisable to read too much into these results, which are indicative rather than conclusive.[13/] In general, the finding of this excercise is that there is no statistically significant difference in the impact of public and private manufacturing investment on the rate of growth of GDCF. High levels of public manufacturing investment did not drain the economy of future investment funds and thus did not impede the growth of manufacturing investment for the countries in our sample. This aggregate level similarity in the impact of public and private sector investment on the growth of GDCF should not obscure the fact that there is a wide range of experiences which developing countries have had when they have attempted to use the public enterprise as an instrument of resource mobilization. There are no economically valid reasons for expecting public enterprises to be less efficient or less successful as vehicles for surplus generation than the multinational corporation or domestic business. The impact of public enterprises on levels of domestic resource mobilization is determined by a varied and complex

set of factors - the nature of incumbent regimes, the domestic and international operational environment, the resource endowment of the country concerned, the technical competence of planning and administrative personnel, etc.

In any case, a balanced view on the comparative performance of public and private manufcturing enterprises must place as much emphasis on their ability to utilize existing resources as it does on their capacity for resource mobilization. Since most developing countries are labour-abundant economies, an assessment of the impact of investment on employment generation is particularly important.

Statistics on employment by public and private manufacturing enterprises were available for Bangladesh, Egypt, India, Iraq, the Democratic Republic of Korea, Mexico, Pakistan, Sri Lanka, Syria, Tanzania, the Yemen Arab Republic and Democratic Yemen. These figures are reported separately. There is a wide range of country experience in the rate of growth of public manufacturing employment. It has exceeded that of total manufacturing employment in some countries and the reverse is the case in others. In general one gets the impression that in many developing countries - Egypt, Iraq, Mexico, Syria - the rate of growth of public sector MVA has kept pace with the rate of growth of public manufacturing employment. Thus, for Mexico detailed figures on the distribution of investment and employment are available over the period 1960-75. In 1965 the public sector's share of total industrial employment was 44 per cent lower than its share of industrial output. In 1975, the public sector's share of total employment was only 22 per cent

lower than its share of sector output. Thus the increase in the public sector's share of industrial employment was greater than the increase in its share of industrial output or value added over the period 1960-75. This is so despite the fact that public manufacturing investment and production tends to be more strongly concentrated in the intermediate and investment goods industries which are relatively capital intensive. Detailed figures for the inter-industrial distribution of employment were available only for Mexico. If industries are ranked by an index of capital intensity[15/] on the one hand and the relative share of public sector employment to total employment on the other, we obtain a value of +0.41 for the Spearman's rank correlation coefficient. The value of this coefficient for industries ranked by the same measure of capital intensity and share of private sector employment is significantly negative. This would suggest that public sector enterprises have higher capital output ratios than private sector ones in Mexico. Estimates for the capital output ratio were obtained for Egypt, India, Iraq, the Republic of Korea, Mexico, Pakistan and Syria. Only in the case of Pakistan did we find that the value of the incremental capital output ratio of the public manufacturing sector was significantly lower than the value of the ratio for the total manufacturing sector. This result is largely explained by the nature of the data on the basis of which calculations were made. The data has been taken from a study which has been concerned with investment and production in projects already in operation. In particular, the large capital-intensive Karachi steel mill complex has been excluded from the study. This accounts for the very

low computed value for the capital output ratio of the public manufacturing sector in Pakistan. In India there is no significant difference in the value of the estimated capital output ratio for public manufacturing enterprise on the one hand and for the total manufacturing sector on the other.

In the case of all other countries it was found that public manufacturing enterprises employed more capital intensive techniques of production than did private enterprises. This is largely a reflection of the inter industrial distribution of public production units. They generally tend to be concentrated in industrial branches in which the requirements for capital intensive production technology is high. The only country for which it was possible to obtain sufficient data to test differences in capital intensity within the same industry was India. It was found that public manufacturing enterprises used more capital intensive technologies of production in the chemicals and petro chemical industry and that there was no significant difference in the capital intensity of public and private firms in (a) medium and light engineering (b) transport equipment and (c) food manufacturing [16/]. On the basis of this investigation it is clearly not possible to make a strong statement about relative capital intensity but it is likely that branch specific characteristics particularly technology employed and marked conditions are a much more significant determinant of the pattern of factor use than ownership structure.

The availability of firm level data in the case of India and Pakistan allowed the estimation of production functions for public and private manufacturing firms in these countries. These models showed that for the

Indian sample the estimate obtained for the elasticity of substitution parameter does not differ significantly in the case of public and private sector firms. In the case of Pakistan however public manufacturing enterprises are seen to have very low substitution possibilities as against private manufacturing enterprises where high values were estimated for the elasticity of substitution parameter. Public manufacturing enterprises in Pakistan have a limited capacity to absorb labour in response to changes in factor prices, relative to private firms. This implies that the former group of firms have not made a substantial contribution to employment expansion within the manufacturing sector. The relationship between output growth and employment growth (Verdorn's Law) is investigated in the public manufacturing sector for data drawn from a sample of pooled observations obtained from the following developing countries: India, Mexico, Egypt, Iraq, Syria, Pakistan, Bangladesh and Sri Lanka for various years over the period 1966-1967. Statistical tests showed that the pooling was justified. The results obtained however suggest that the relationship between employment growth and output growth is a weak one. Employment growth is also not strongly associated with productivity. Sufficient observations on private sector manufacturing employment could not be obtained. However for a sample of 30 developing countries it was possible to obtain estimates of <u>total</u> manufacturing production and employment for the period 1970-77. Once again the relationships between employment growth and productivity and employment growth and output growth were seen to be very weak. Such results have also been reported for developed market economy countries by Cripps and Tarling for example, who argued that the

lack of association between output and employment growth, establishes the invalidity of Verdorm's Law[18/]. In any case the present investigation has failed to unearth any evidence about significant differences in the impact of public and private manufacturing investment on employment generation except perhaps in the case of Pakistan.

The pattern of resource utilization may also be investigated by looking at the output and employment linkages of public manufacturing enterprises. Information on linkages was available for only three countries - Bangladesh, Iraq and Thailand. In the case of Thailand relatively high forward linkages are to be found in wood products, fercilizers, paper products and leather products. Sugar, jute manufacturing, leather products and meat canning have high backward linkages. It is interesting to note that the value of Spearman's correlation coefficient[19/] of industries ranked by the forward and backward linkage indicators is significantly negative - although the limited number of observations means that we should not read too much into this finding. However there is some evidence to show that in Thailand "sectors that have high forward linkages would generally induce low backward linkages"[20/]. It is to be observed however that the only sectors with significant backward linkages are sugar and jute manufacturing. It cannot be argued that public manufacturing enterprises are concentrated in sectors with high levels of backward or forward linkages - the exception here being the jute manufacturing industry. In any case - a direct comparison with Thai private manufacturing industry is not possible due to lack of data.

Table 5. Backward and Forward Linkages in Iraq Manufacturing

Sectors	Forward Linkages	Backward Linkages
Public sector predominant	1974	1974
Food, beverages and tobacco	0.46	0.89
Textiles	0.24	0.44
Rubber and chemicals	0.52	0.30
Petroleum refining	0.60	0.42
Non metalics	0.82	0.54
Private sector predominant		
Leather	0.28	0.71
Paper	0.75	0.39
Metalic minerals	0.24	0.16
Machinery	0.16	0.27
Other manufactures	0.11	0.21

Source: UNIDO Long Term Prospects of Industrial Development in Iraq UNIDO/ICIS 139, 1980 p.77-84 and 91-92.

Quantitative estimates of direct and indirect linkages are not available for Bangladesh industry. It has been estimated for the middle 1970s however that the ratio of agricultural input to gross valued added is 60 per cent for jute manufacturing, 40 per cent for sugar, and 40 per cent for paper products[21/]. In all these sectors public manufacturing enterprises play an important role. Emphasis has also been put on the role of these units to increase production of agricultural inputs. A comparison with private sector firms is however not possible.

In the case of Iraq direct and indirect linkages can be estimated for sectors with public and private sector dominance. These estimates are presented in Table 5 although there are ambiguities involved in classifying a sector in terms of public and private firm predominance. The rough indications of Table 5 seem to be that in Iraqi manufacturing public enterprises have higher backward and forward linkages. The highest forward linkages are generated by the non metallic minerals sector and although paper products are second in ranking, firms in this category include a very large number of government owned publishing plants: leather has the next highest rank among "private sector" branches, petroleum refining chemicals and food and beverages generate higher levels of forward linkages; these are all sectors in which the public sector firms predominate. Similarly sectors with public sector predominance also generate a higher level of backward linkages - the exception here being the leather products industry.

It is clear of course that such a comparison is less than adequate. Optimally we would need to look at the linkage generation impact of public and private units situated within the same industry to discover

significant differences and similarities. This however was not possible given the available data.

In this section we have looked at the capacity of public and private manufacturing enterprises to generate surplus and to effectively utilize productive resources. Public manufacturing enterprises are relatively insignificant sources of national saving but obtain a significant proportion of total investment. Patterns of resource utilization are broadly similar, however, there is a wide range of country experience. In general it seems that production and marketing specific characteristics are far more significant determinant of the pattern of resource use than ownership structure. Limitations of data prevented a thorough and detailed investigation of similarities and differences in public and private firms within the same industry from being undertaken.

Impact on export expansion and import substitution

It was not possible to obtain data for estimating the direct balance of payments effect of public and private sector investment[22/]. Data on exports from the public manufacturing enterprises were available for Bangladesh, India, Pakistan, Peru, Tanzania and the Republic of Korea. However it is not possible to make any comparative evaluation of public and private enterprises in this regard. It is sometimes argued that public manufacturing enterprises are not particularly successful exporters. However these firms have undertaken comprehensive import substitution and export expansion promotion programmes in a diverse range of industrial branches including steel making (in Indonesia, India and

the Republic of Korea) petro-chemicals (in Brazil, Mexico and Venezuela), ship-building (Republic of Korea) and textiles.

For Iraq and Syria it was possible to estimate the extent of import substitution and export expansion with the help of Chenery's standard formula.[23/] The results are reported in Tables 6 and 7. In the case of Iraq the only industry that recorded significant export growth was cement. Public sector firms were predominant within this industry. In terms of import substitution, textiles, chemicals and transport manufacturing firms achieved significant progress within the first subset. Among industries in which the private sector firms are predominant, plastics, machinery, electrical equipment, leather, clothing and wood products experienced significant levels of import substitution during the period 1960-1969. During the second period machinery was the only branch in which exports accounted for a significant proportion of total growth. No public sector dominated industry experienced substantial export expansion during this period and chemicals was the only "public sector dominated" industry with a high level of import substitution. As against this, three industries in which the private sector predominated experienced significant import substitution. These were leather products, metal products and electrical equipment. There is some tentative evidence to suggest that where as there is little to distinguish the export performance of the public and private sectors of Iraqi manufacturing, the private sector has contributed more towards import substitution.

In the case of Syria for the branches in which the public sector firms are predominant exports have been an important source of growth for

Table 6. Sources of output growth in Iraq manufacturing

(in percentages)[a/]

(a) 1960 - 1969

	Domestic demand	Exports	Import substitution
Public sector predominant			
Beverages	99.89	0.1	0.00
Cigarettes	100.46	-0.46	0.00
Textiles	47.30	1.73	50.95
Chemicals	21.99	-0.04	78.68
Cement	67.73	33.32	-1.11
Other non metallics	619.11	1.99	-521.19
Transport	0.33	0.00	99.66
Private sector predominant			
Clothing	9.48	0.44	32.19
Wood and furniture	72.42	0.60	29.97
Leather	62.08	1.74	37.02
Plastics	5.95	1.74	92.33
Metal products	230.67	1.84	-132.52
Machinery	43.80	0.01	56.17
Electrical equipment	46.16	0.05	56.83

Table 6 (contd.)

(b) 1969-1975

	Domestic demand	Export	Import substitution
Public sector predominant			
Beverages	115.97	-0.13	-15.73
Cigarettes	113.55	0	-13.55
Textiles	104.77	0.02	-4.75
Chemicals	36.05	0	63.90
Cement	124.07	-18.00	-6.07
Other non-metallics	52.38	0	-47.62
Transport	1,323.60	0.09	-1,223.70
Private sector predominant			
Clothing	94.32	0.02	5.64
Wood and furniture	170.20	-0.05	-70.14
Leather	43.49	0.00	55.88
Plastics	151.75	-2.21	-49.54
Metal products	44.55	-0.10	55.54
Machinery	-768.50	-13.03	779.84 b/
Electrical equipment	65.36	0.00	34.63

Source: UNIDO, Long-Term Prospects of Industrial Development in Iraq UNIDO/ICIS.139, 1980, p.235-239.

a/ figures do not add up because of rounding

b/ In the case of machinery there was negative growth over the period 1969-1975. This means that import substitution contracted and domestic demand and exports expanded.

textiles and petroleum refineries. Among the private sector industries plastic products, wearing apparal, leather products and footwear have experienced substantial export growth. Substantial levels of import substitution has occured in the paper products, printing and food manufacturing branches. The only "public sector predominant" branch in which significant import substitution has been achieved is the "other non metallic mineral products" branch. It may therefore tentatively be concluded that the private sector industries have been relatively more successful in terms of both export promotion and import substitution in Syria. It may well be however that industry specific characteristics - such as the production technology employed and domestic and international market conditions may be more important determinants of export and import substitution than the ownership structure of the firms. Once again it would be desirable to compare public and private sector firms within the same industry. This has not been possible, however, due to lack of data.

In the case of Mexico estimates of trade balances of total industry and of public sector enterprises within each industrial branch are available. These are reproduced in Table 8. It is seen that in each of the three years for which data is available both the manufacturing sector as a whole and the public manufacturing sector had a trade deficit. In 1970 the only branches in the private sector with a significant level of trade surplus in total manufacturing had been food manufacturing and furnitures. In the public manufacturing sector food manufacturing and textile branches had trade surpluses. In 1975 the situation deteriorated substantially. The overall manufacturing deficit in that year was 2.3

Table 7. Sources of output growth in Syrian manufacturing 1974-1977

(in percentages)

	Domestic demand	Exports	Import substitution
Public sector predominant			
Tobacco	107.65	-25.65	18.20
Textiles	2.09	119.94	-22.03
Chemicals	438.95	1.63	-340.58
Industrial chemicals	118.30	0.8	-19.10
Petroleum refineries	110.39	13.99	-24.38
Rubber products	214.00	2.57	-116.57
Glass products	340.80	-27.98	-212.91
Other non-metallics	98.53	8.65	-7.36
Iron and steel	16.60	0.32	85.08
Non-electrical machinery	148.73	1.25	-49.97
Electrical machinery	235.94	1.08	-137.01
Private sector predominant			
Food manufacturing	28.19	7.65	64.16
Beverages	89.59	7.97	2.44
Wearing apparal	93.33	13.75	-7.05
Leather products	94.45	13.71	-8.16
Footwear	90.86	10.25	-1.11
Wood products	93.07	2.68	4.25
Furniture	99.87	5.02	-4.89
Paper products	0.67	-0.12	99.45
Printing	32.35	0.35	67.28
Plastic products	93.65	33.71	-27.36
Non-ferrous metals	237.63	-0.61	-137.03
Fabricated metal products	201.73	5.69	-107.41
Misc. manufacturing	103.15	-1.88	-1.27

Source: "Long-Term Prospects of Industrial Development in Syria, UNIDO/ICIS 1979, (Statistical Appendix)

a/ Figures may not add up because of rounding.

times larger than that in 1970. The public manufacturing sectors' deficit in 1975 was more than 20 times larger than in 1970. Particularly large deficits emerged in the basic metal, transport equipment and chemical branches of the public manufacturing sector. The food manufacturing and textile branches within the public manufacturing sector continued to show a healthy surplus. The performance of the public textile industry is particularly remarkable in that it showed a substantial surplus whereas the private textile industry had an overall deficit of 170.9 million pesos. By 1978 the total manufacturing sector trade deficit had once again doubled over its 1975 level. However the public manufacturing sector trade deficit declined substantially. It was 58.3 per cent lower than 1975. Although textiles was the only sector within public manufacturing which showed a large surplus, deficits in many other branches were substantially reduced. Trade surpluses were also generated by the private sector in a diverse range of industrial branches - including petroleum, non-metallic minerals, food manufacturing, metal products and beverages. It thus appears that both public and private manufacturing enterprises had improved their export performance by 1978.

The findings in this section cannot be described as conclusive. Clearly the range of experience among developing countries is too varied to be adequately represented by our very limited sample. Moreover an analysis of policies requires information at the firm level. This we have been able to obtain for only two countries within our sample, India and Pakistan. In the next section an attempt is made to compare and contrast policies of public and private manufacturing enterprises with the help of firm level data.

Table 8. Trade balances in Mexico 1960, 1975, 1978 at the branch level (in million pesos) public enterprises

CONCEPT	National total			Public sector enterprises		
	1970			1970		
	Imports	Exports	Balance of an account	Imports	Exports	Balance of an account
Manufacture industries	26,638.6	7,978.1	-18,680.5	1,527.2	1,107.0	-420.2
Manufacture of food	328.0	2,386.5	2,058.5	12.5	497.9	485.4
Manufacture of beverages	51.9	53.3	1.4	-	-	-
Manufacture of tobacco products	10.3	6.4	-3.9	-	-	-
Textile industry	450.5	341.9	-108.6	33.0	130.7	97.7
Manufacture of clothes	362.9	149.4	-213.5	3.0	-	-3.0
Manufacture of shes and leather	320.4	96.8	-223.6	-	-	-
Manufacture of wood and cork products	230.0	126.4	-103.6	0.3	-	-0.3
Manufacture and reparation of furniture and accessories	-	38.5	38.5	-	-	-
Paper industry	1,226.0	62.3	-1,163.7	41.2	-	-41.2
Publishing, printing and connected industries	269.1	229.5	-39.6	1.0	-	-1.0
Chemical industry	2,887.8	1,003.2	-1,884.6	146.9	11.5	-135.4
Refinement of petroleum and mineral coal	-	7.8	7.8	-	-	-
Manufacture of plastic and rubber products	1,026.2	17.4	-1,008.8	63.3	3.1	-60.2
Manufacture of non-metallic mineral products	255.8	209.8	-46.0	2.3	-	-2.3
Basic metals industries	2,254.7	1,295.3	-959.4	563.9	329.6	-234.3
Manufacture of metallic products	298.0	201.1	-96.9	0.2	-	-0.2
Manufacture, assembly and reparation of machinery, equipment and spare parts, excluding electrical	6,871.9	500.5	-6,371.4	0.8	-	-0.8
Manufacture of assembly of machinery, equipment, apparatus, accessory and electrical and electronical articles and spare parts	3,245.4	713.0	-2,532.4	-	-	-
Construction, reconstruction and assembly of transport equipment and spare parts	5,051.2	361.4	-4,689.8	658.4	134.2	-524.2
Other manufacture industries	1,518.5	177.6	-1,340.9	0.4	-	-0.4
Petroleum and its derivates	552.8	504.9	-47.9	897.7	-	-897.7

Table 8 (continued)

CONCEPT	National total			Public sector enterprises		
	1975			1975		
	Imports	Exports	Balance of an account	Imports	Exports	Balance of an account
Manufacture industries	61,712.5	17,993.2	-43,719.3	12,156.6	3,381.1	-8,775.5
Manufacture of food	499.2	4,305.4	3,806.2	425.0	1,786.2	1,361.2
Manufacture of beverages	308.4	347.4	39.0	-	-	-
Manufacture of tobacco products	3.5	2.2	1.3	4.3	-	-4.3
Textile industry	617.1	1,460.0	842.9	33.9	1,047.7	1,013.8
Manufacture of clothes	496.5	424.7	71.8	8.3	17.6	9.3
Manufacture of shoes and leather	407.2	228.6	178.6	-	-	-
Manufacture of wood and cork products	436.9	313.9	123.0	17.6	-	-17.6
Manufacture and reparation of furniture and accessories	-	33.2	33.2	-	-	-
Paper industry	2,412.7	60.0	-2,352.7	272.2	-	-272.2
Publishing, printing and connected industries	598.7	437.8	160.9	1.5	-	-1.5
Chemical industry	4,939.2	2,655.2	-2,284.0	1,466.3	26.5	-1,439.8
Refinement of petroleum and mineral coal	-	59.6	59.6	-	-	-
Manufacture of plastic and rubber products	2,214.7	41.0	-2,173.7	53.8	4.0	-49.8
Manufacture of non-metallic mineral products	631.4	751.8	120.4	255.6	77.9	-177.7
Basic metals industries	8,094.4	2,478.0	-5,616.4	5,685.4	148.2	-5,537.2
Manufacture of metallic products	612.1	600.6	11.5	5.1	5.9	0.8
Manufacture, assembly and reparation of machinery, equipment and spare parts, excluding electrical	17,946.8	790.5	-17,156.3	40.0	0.4	-39.6
Manufacture and assembly of machinery, equipment, apparatus, accessory and electrical and electronical articles and spare parts	4,445.2	749.3	-3,695.9	-	-	-
Construction, reconstruction and assembly of transport equipment and spare parts	14,175.7	1,743.1	-12,432.6	3,885.2	466.7	-3,418.5
Other manufacture industries	2,872.8	510.9	-2,361.9	2.4	-	-2.4
Petroleum and its derivates	4,188.0	5,281.8	-1,093.8	4,401.4	-	-4,401.4

Table 8 (continued)

CONCEPT	National total			Public sector enterprises		
	1978			1978		
	Imports	Exports	Balance of an account	Imports	Exports	Balance of an account
Manufacture industries	142,985.8	48,949.7	-94,036.1	7,037.3	3,398.9	-3,638.4
Manufacture of food	1,141.5	7,763.5	6,622.0	488.8	481.6	-7.2
Manufacture of beverages	525.8	1,043.0	517.2	-	-	-
Manufacture of tobacco products	1.9	4.8	2.9	-	-	-
Textile industry	1,518.2	2,545.9	1,027.7	38.4	794.6	755.2
Manufacture of clothes	1,291.3	821.2	-470.1	39.6	12.6	-27.0
Manufacture of shoes and leather	1,293.9	822.1	-471.8	-	-	-
Manufacture of wood and cork products	792.5	1,418.2	625.7	16.3	-	-16.3
Manufacture and reparation of furniture and accessories	-	145.2	145.2	-	-	-
Paper industry	4,360.5	173.7	-4,186.8	230.0	0.1	-229,9
Publishing, printing and connected industries	1,331.5	1,369.8	38.3	4.4	-	4.4
Chemical industry	13,582.9	6,654.0	-6,928.9	8,656,6	387.4	8,269.2
Refinement of petroleum and mineral coal	-	388.5	388.5	-	-	-
Manufacture of plastic and rubber products	6,937.1	211.8	-6,725.3	44.5	53.3	8.8
Manufacture of non-metallic mineral products	1,172.4	3,467.8	2,295.4	21.8	0.4	-21.4
Basic metals industries	26,593.5	4,891.2	-21,702.3	1,616.6	692.1	-924.5
Manufacture of metallic products	1,366.9	2,517.9	1,151.0	27.1	-	-27.1
Manufacture, assembly and reparation of machinery, equipment and spare parts, excluding electrical	38,835.8	2,603.2	-36,232.6	-	-	-
Manufacture and assembly of machinery, equipment, apparatus, accessory and electrical and electronical articles and spare parts	9,328.7	1,879.1	-7,449.6	-	-	-
Construction, reconstruction and assembly of transport equipment and spare parts	26,195.3	8,486.5	-17,708.8	1,853.2	970.4	-882.8
Other manufacture industries	6,716.1	1,742.3	-4,973.8	-	6.4	6.4
Petroleum and its derivates	6,997.2	41,140.8	34,143.6	5,405.3	49.9	-5,355.4
Other brances of activity	19,422.8	33,382.6	13,959.8			

Source: UNIDO Public Industrial Enterprises in Mexico, Mexico, 1980, p.223-239.

a/ Includes public and private enterprises

Notes
Chapter I.

1/ This measure estimates the extent to which the two rankings are similar. Thus a value of +1 for the Spearman coefficient implies that ranks obtained by all industrial branches in terms of level of public investment in the earlier year were exactly similar to ranks obtained in terms of share in output or value added in the later period.

2/ This is not shown in Table 1 which estimates r_s for share in public investment and share in output.

3/ Jones, L., Public Enterprise and Economic Development I, The Korean Case, Korean Development Institute, Seoul, 1975, p.73.

4/ Following H. Chenery and M. Syrquin (Patterns of Development 1950-1970 Oxford University Press, London 1975). A regression equation was specified in which the share of public manufacturing investment in gross domestic product was taken as the dependant variable and the log of income per capita and the log of the square of income per capita were taken as the independant variables. This equation was applied to data, obtained.

5/ V.Bornischer, "Multinational Corporations and Economic Growth", Journal of Development Studies, summer 1980, p. 191-210.

6/ M. Dolan and B. Tomlen "First World Third World Linkages", International Organization, vol.34, no. 1, 1980, p. 41-63. In their studies, income per capita growth was regressed on (a) an estimate of the stock of TNC capital in the beginning of the period under study, (b) TNC investment in the period and (c) a control variable which is a function of the logged level of the income per capita at the beginning of the period. Bornischer finds that the stock of TNC capital is negatively associated with income growth on the one hand and TNC investment is positively associated with the growth of income per capita on the other.

7/ Bornischer, op. cit., p. 195-199.

8/ Jones, L., Public Enterprises and Economic Development: The Korean Case, Korean Development Institute, Seoul, 1975, p.1.

9/ Figures taken from Government of India. National Accounts Statistics, 1970-1971 to 1977-1978, New Delhi, 1980, p.60-61.

10/ Figures from UNIDO. Long Term Prospects of Industrial Development in Syria, UNIDO/ICIS 172, 1980.

11/ All figures cited are from UNIDO Long-Term Prospects of Industrial Development in Iraq, Algiers, 1979, p.120,181.

12/ Villareal, Public Enterprise in the Oil Perspective, Mexico, 1980.

13/ Although by treating the quadratic terms separately these equations can be reduced to a linear form and can be handled by the method of ordinary least squares; it is likely that there exists a large degree of multi colinearity between the inear and the quadratic terms of the independent variable (in our case log GDP_{t-1}). The variances of the estimated parameters are likely to be high and the corresponding t values are likely to be small. The individual estimated parameters of the equation are likely to be quite uncertain. Although by using "pooling techniques" the problem of small sample size was avoided this led to increasing the level of autocorrelation and hetroscedasticity of the disturbance term and the underestimation of parameter variances.

14/ Derived from UNCTC, Transnational Corporation and Employment (unpublished), New York, 1980, p.183.

15/ Data was available for 1972 only.

16/ Cobb-Douglas, Constant Elasticity of Substitution and Variable Elasticity of Substitution (VES) functions were estimated. The VES production function generally gave better results.

17/ F. Cripps and R. Tarling, Growth in Advanced Capitalist Economies 1950-1970, Cambridge University Press, London 1973.

18/ See footnote 1/.

19/ IDRC op. cit., p.1-60.

20/ ICPE Bangladesh, p.52-53.

21/ The direct balance of payment effect of public and private investment may be estimated as follows:

$$Bd = (X+I) - (C_k+C_r+R+D)$$

where Bd is the direct balance of payments impact

X = fob value of export
I = inflow of capital from abroad including retained profits.

C_k = c.i.f. value of capital goods imported

C_r = c.i.f. Value of imported raw materials and intermediate goods.

R = royalties and fees paid abroad after tax.

D = net profits after tax and interest accuring abroad.

22/ Chenery, H., "Patterns of Industrial Growth", American Economic Review, 1960 (50), p.624-654.

II. POLICIES OF PUBLIC AND PRIVATE MANUFACTURING ENTERPRISES IN INDIA AND PAKISTAN

Framework for analysis

This section sets out to answer the following questions:

(a) What are the determinants of the growth of public manufacturing enterprises (PME)?

(b) What are the determinants of their investment?

(c) What are the determinants of their profitability?

These questions have been widely studied within the context of the theory of the growth of the firm and the theory of investment: extensive reviews of this literature have been published[1/]. Empirical tests of several hypotheses based on these theories have led to a wide range of explanations and findings about the behaviour of firms with respect to their investment and financing behaviour. Although public industrial enterprises are attracting increased attention, there are relatively few in-depth studies of their investment policies. The size of the sample available in the present study is small and at present limited to only two countries, but it is hoped that some of the issues discussed may provide an insight into aspects of PME policies that could prove useful for an assessment of their impact on industrialization in developing countries.

The study relies mainly on data gathered from balance sheets and profit and loss statements of individual companies. Standardized "analysis of accounts" were available in the case of both India and Pakistan. Estimates based on company accounts are, of course, subject to

wide margins of error. They do not provide wholely satisfactory criteria for evaluating a firm's performance, particularly when many of the costs are determined on the basis of transactions internal to the firm. Moreover, these estimates are generally based on accounting conventions that do not adequately represent the impact of inflation on, e.g., the valuation of fixed assets. There are also many ambiguities in the method of valuation employed. There are often errors of omission, particularly in the Appropriation of Income Statement. Items such as wages and purchases of raw material are often absent. Statements on "Sources and Uses of Funds" omit "book" transactions - i.e. those internal to the company, such as revaluation of fixed assets.[2/]

There are many other shortcomings and limitations to which such data are subject. However, the existence of broadly similar company objectives ensures that there is a basic consistency in these figures. Thus, it can be predicted that fixed assets will usually be undervalued in balance sheet statements. "It is considered almost criminal to over value and prudent to under value."[3/] Accounting conventions remain fairly stable over time - and across continents. Thus, the many problems that arise in the use and interpretation of accounting data - the inability to take inflation into account in the valuation of assets, the arbitrary nature of depreciation estimates, conceptual ambiguities involved in the definition of categories such as "capital employed" and "net worth" - are in principle amenable to theoretical handling. Estimates of the gross value of public sector manufacturing investment, of value added created by such enterprises and of the financial policies

they pursue are usually available only in data of this type. To avoid the use of such data, because of the problems inherent in its interpretation and the difficulties of comparison between countries and over time, would limit the scope of investigation of PME behaviour to an aggregate level.

There is a need to gather data of this type from a large number of developing and developed countries over an extended time period, and to subject this data to scrutiny in order to develop an appropriate conceptual framework for reconciling its contradictions, improving its estimates and widening the possibility of international (and inter-temporal) comparability of the trends that it reveals.

Data were taken from the volumes published by the Government of India, Ministry of Finance, over the period 1972-73/1978-79.[4/] Firms selected satisfied both of the following criteria:

(1) They continued to exist over the entire six-year period;

(2) They belonged to one of the following industrial branches:

(a) iron and steel;
(b) chemicals and pharmaceuticals;
(c) medium and light engineering;
(d) transport equipment;
(e) food manufacturing and leather processing firms included in the "agro-based" industrial branch; [5/]
(f) petroleum.

In the absence of a proper sample design it is of course impossible to correctly guage the "representativeness" of this sample. On average the firms in the sample account for about 72 per cent of the total

assets of Indian manufacturing public sector enterprises.[6/] It is clear that the sample includes the largest public manufacturing enterprise in India, and an analysis of the data can provide useful insights into the policies pursued by the Indian public manufacturing sector.

It was not possible to obtain balance sheets of private sector manufacturing companies for the same period as in India. For the period 1966-71, data were obtained for the 30 largest domestic private manufacturing companies and all TNC manufacturing subsidiaries and affiliates included among the top 300 companies (listed in the publication "Top 300 Companies" issued by the Economic and Scientific Research Foundation, New Delhi, 1979) for which data were continuously available.

The Pakistani data were extracted from the State Bank publication "Balance Sheet Analyses of Joint Stock Companies, Listed on Karachi Stock Exchange, 1972-77", (Karachi 1979). Twenty-three companies that were identified as public manufacturing concerns by the IDRC publication "Role and Performance of Public Enterprises in the Economic Growth of Pakistan" (Karachi 1980), were included in the State Bank publication and continued to exist throughout the period. Thirty of the largest manufacturing private sector companies accounting for almost 46 per cent of the sales of all manufacturing companies registered on the Karachi Stock Exchange were also included in our sample.

Once again it is clear that the representativeness of the Pakistan sample cannot be accurately ascertained. The sample includes the largest firms in operation. An attempt has been made to develop a set of common indicators that can be used to assess firm behaviour.

Broad trends of relationships between growth, profitability and financing variables

The measures calculated are described in Appendix I. They represent financial estimates of the growth of individual companies, of changes in their size and in their financial position. Alternate measures of corporate profitability have also been estimated. In general, the definition of these variables is along conventional and generally accepted lines.

In Appendix I are also presented correlation matrices of the indicators for the five sub-sets of the data. Since most of the subsequent analysis focuses upon an examination of these figures, it will be sufficient at this stage to identify the salient features relatively briefly.

There seems to be very little association between size and growth and size and profitability for the Indian public sector firms. None of the estimated zero order correlation coefficients are statistically significant. Indeed, size does not seem to be related to any of the indicators. This implies that larger firms did not enjoy any particular advantages in terms of access to government or bank finance. Their growth and profitability performance did not significantly differ from those of the smaller public firms. Hence the impact of public sector growth on overall levels of industrial concentration within manufacturing is likely to be small.

The Indian private sector firms' both domestic and foreign subsidiaries appear to have a weak negative association between growth and size. The domestic private sector firms have a weak positive and the foreign subsidiaries have a weak negative association between size and the profitability indicators. Size indicators once again seem not to be strongly related to any of the financial variables except in the case of the domestic firms. There is an association between size and the debt-equity ratio indicating that the larger private firms had higher access to loan capital. It does not seem as if the level of industrial concentration was accentuated by the pattern of private manufacturing sector growth in India. In the case of Pakistan, a clear contrast emerges in the performance of public and private sector firms in this respect, whereas there is no association between size on the one hand and the growth and profitability indicators on the other for public firms; a significant association between both growth and size and growth and profitability is evident in the case of the private sector sample. The "borrowing" indicator is also strongly associated with size in this group. It thus appears that industrial concentration was increasing within the private sector during the period 1972-77 in Pakistan.

In the public sector firms of both Pakistan and India, the growth rate indicator is not significantly associated with any of the profit estimators. This would indicate that financial performance has not been a major determinant of growth. As expected, growth is strongly correlated with gearing and liquidity ratios and not associated with the internal finance indicators. This indicates that rapidly growing public firms were dependent on loan capital and equity capital. A significant

proportion of this capital was made available from foreign sources in the case of the Indian sample. The matrix shows a significant positive association between growth and the foreign finance ratio.

In the case of the private sector firms, on the other hand, there is evidence of strong positive association between growth and profitability in the Pakistani sample. Association between these two variables is also significant for the Indian domestic private sector firms. In the Indian subsidiary sample, association between growth and profitability indicators is again low. In the Pakistani private sector sample, growth is strongly associated with measures of both internal and external finance. The rapidly growing firms had easier access to credit and also mobilized a significant proportion of their resources internally. In the case of the domestic Indian firms, rapidly growing firms did have higher debt/equity ratios but the association between growth and the retention ratio was insignificant. The foreign subsidiaries sample showed no relationship between growth and the financing indicators.

Profit measures are significantly positively correlated with the divident ratio, the internal finance ratio and the foreign finance ratio for the Indian public firms. There is a weak but statistically significant negative association with the borrowing ratio. It is difficult to interpret these results in that they do not reveal the direction of causation. It cannot, for example, be said that the public firms that resort to bank borrowing do not use their funds "efficiently" - hence the lack of association between profitability and the external finance ratio. It may well be the case that profitable public firms do not need to borrow from external sources. Detailed investigation is

required to estimate the direction of causation. In the case of the Pakistani public sector firms, there is a significant negative association between profitability and the borrowing indicator. There is no correlation here between profitability and the internal finance indicators. In the sample of Indian domestic private sector firms, there is strong association between profitability and borrowing and some evidence of a weak negative relationship between profitabilty and the retention ratio. The Indian transnational sample indicates that profitable firms have relatively high levels of profit retention, the association between profitability and the debt/equity is generally negative. In the Pakistan sample, private sector firms exhibit significant association between profitability on the one hand and both internal and external finance indicators on the other. Clearly there is a wide spectrum of financing behaviour evident in the different groups of our sample.

Finally, it is important to note that the association between growth and some financial indicators exists independently of any indirect influence of profitability in the Indian and Pakistan public sector samples. The profitability indices are not significantly associated with growth. Moreover, they are not related to gearing or the liquidity measures which are strongly associated with growth. Thus, financial factors may be exercising an independent influence on the growth of public firms without the intermediation of profits. This has to be borne in mind particularly in the study of the investment behaviour of the public manufacturing concerns.

In subsequent sections an attempt will be made to develop further the findings presented in the Appendix. First, attention will be focussed on an analysis of the growth process. This study will permit an investigation of the impact of public and private sector growth on industrial concentration. Although in India and Pakistan some key manufacturing sectors are reserved for the public sector, it is not the case that a single enterprise spans an entire industrial branch included in our sample. Complete monopoly does not exist in any area - although in the Indian iron and steel industry where only two public firms exist such a market structure is approached[7/], and it is clearly of some relevance to enquire as to whether or not concentration has been increasing as a consequence of growth. Economic theory generally holds that an increase in industrial concentration is likely to have an impact on a wide range of policies and on the performance of firms situated in monopolistic markets.

Relationship of size and growth

Industrial concentration can be studied by focussing attention on the relationship between growth and size. The theory of the growth of the firm[8/], which was developed after World War II, breaks with its neo-classical progenitor and treats growth as a strategic choice of management. In certain circumstances, management may prefer a strategy that emphasizes maximization of growth rather than profits. The two major themes emerging from this literature seem to be the relationship between growth and size of the firm on the one hand, and growth and the level of profitability on the other.

The first theme has been the subject of a number of empirical studies designed to test "The Law of Proportionate Effect" (Gibrat's Law). The "law" states that the probability of a firm growing at any (given) rate is independent of the initial size of the firm. Hence, the "law" implies that there is no "optimal" size of the firm[9/]. Neither of these assertions are generally supported by the modern theory of the growth of the firm[10/].

Gibrat's Law also implies that the rate of growth of a firm in one period does not influence its rate of growth in the subsequent period. A related hypothesis is that there is an inherent tendency towards increasing concentration (if large and small firms grow at the same rates, large firms will eventually predominate and concentration will rise).

In order to test the "law of proportionate effect" for the sample of companies in this study, linear regression models were applied to the data[11/]. In the case of Pakistani public sector firms, there is no evidence that size is associated with growth. In the case of the Indian public sector firms neither the regression coefficient nor the coefficient of determiniation are significantly different from zero in the linear model.[12/] In the logarithmic equation, however, both these coefficients are significantly different from zero at a 5 per cent confidence limit. The value of the coefficient of determination is relatively small however. It may therefore be said that a weak negative association has been discerned between size and growth. In the case of the Indian private sector firms, a weak negative association emerges in the logarithmic equation. No evidence of a systematic variation of

growth and size emerges in the case of the Indian subsidiaries. On the other hand the Pakistan private sector sample showed a significant positive association between size and growth. Thus the growth of private sector firms during the Bhutto period continued to exhibit a tendency of increasing the level of concentration. Similarly the lack of a linear association between size and growth in the Pakistani public firm sample may be interpreted as implying that the Law of Proportionate Effect holds for this data set. It has been argued that the operation of the Law implies increasing concentration[13/]. This is so however if the Law operated in what is described as "the strong form". If as Kalecki argues the probability of growing by a given proportion declines with the size of the firm[14/], the operation of the Law need not imply increasing concentration over time. Thus, our result for the Pakistani public sector firms is not conclusive, but there are grounds for arguing that their growth had a smaller impact on the level of industrial concentration than the growth of the private sector firms.

The relationship between size and growth in the Indian sample of firms is explored in greater detail in Table 9.

The extent to which the findings can be compared is, of course, limited by the difference in the time period to which the public and private sector data relate. The significantly higher growth rates of the public firms is accounted for mainly by the fact that data was obtained for a larger and later time period and differentials in inflation rates during the two time periods were considerable.

Bearing these factors in mind it is possible to note that a broadly similar reationship between size and growth emerges for each data set.

Table 9. Relationship between size and growth, Indian sample

Size class a/	Public firms		Domestic private firms		Indian Subsidiaries	
	Mean growth rate	Std. dev.	Mean growth rate	Std. dev.	Mean growth rate	Std. dev.
Lowest	290.41	256.0	86.64	76.59	115.75	134.80
Second lower	256.65	204.18	79.50	78.53	57.41	61.07
Second higher	79.31	46.61	26.82	46.21	33.76	39.16
Highest	97.06	60.05	42.99	32.69	30.79	39.82

(a) the upper limit of each size class (except the highest) is approximately twice the upper limit of the preceeding size class.

Thus the mean rate of growth of the two highest size classes is lower than the mean rate of growth for the two lowest size classes in each group of firms. This is also true of the standard deviation of growth rates of the higher and lower size classes.

Moreover, the results were statistically tested for significant differences in the value of the means of different size classes[15/]. In the case of the public firms there was a statistically significant difference between (a) the mean of "highest" and "second lowest" size class ((4) and (2)), (b) the mean of "highest" and "lowest" size class ((4) and (1)). On the other hand the difference between the mean of size classes 1 and 2 and the means of classes 3 and 4 were not statistically different from each other. In the case of the domestic private firms the pattern was similar with the means of the lower size classes being significantly different from those of the highest size classes but the mean of the lowest size class did not differ significantly from that of the second lowest size class; nor did the mean growth rate of the highest size class differ significantly from that of the second highest size class. Results obtained for the subsidiaries sample were again similar.

Differences in the standard deviation of the different size classes were also tested[16/] and showed a distinct association between size class and the variablility of growth performances. This difference is most marked when one compares the two highest and the two lowest size classes: however the difference in the standard deviations of size classes 3 and 4 is not statistically significant. There is thus some support for the view that a weak negative relationship exists between size and growth in the present sample of Indian firms. This would suggest that the growth of the three groups of firms have had a modest

impact on reducing overall levels of concentration in Indian manufacturing. It must be emphasized that the relatively small and statistically insignificant differences in the means and standard deviation of growth in the highest size classes imply that the present findings are tentative and not conclusive[17/].

The validity of the Law of Proportionate Effect can also be tested by examining the relationship between the size of a firm at the beginning and end of a time period[17/] using a simple linear model. It has been shown that if the value of the regression coefficient equals or significantly exceeds unity this implies increasing concentration. For all three groups of Indian firms the value obtained for the regression coefficient was significantly below unity. This implies reduced concentration for the smaller firms are shown to be growing at a faster rate than the larger ones. In the case of Pakistan

(a) the value of the regression coefficient is not significantly different from unity for the public firms sample.

(b) it significantly exceeds unity for the private sector sample

This would imply that industrial concentration in Pakistan was increasing during the period under study.

Industrial concentration may be studied from both a static and a dynamic point of view. The former would involve the use of an index of concentration which would measure the predominance of the largest firms in the economy over a time period. The dynamic approach on the other hand studies the way in which the firms in the industrial sector have changed ranks as a result of growth. A "transition matrix" has been built to study the internal mobility of firms in the Indian sample of firms.

Table 10. Transition Matrix for Measuring Firms' Mobility: Indian sample.

A Indian public firms 1972-1979

	Closing Size			
Opening Size	lowest	sec. lowest	sec. highest	highest
lowest	42.8%	28.5%	19.0%	9.5%
second lowest	0	14.2%	71.4%	14.2%
second highest		0	87.5%	12.5%
highest				100 %

Proportion of total firms changing class by

- 1 Size Class	0 Size Class	+1	+2	+3
0	63.46		9.6	3.8

B Indian domestic firms 1966-1971

	Closing Size			
Opening Size Class	Lowest	Sec. Lowest	Sec. Highest	Highest
Lowest	28.57%	71.52%	0	0
Second Lowest	0	18.18%	72.72%	9.09%
Second Highest	0	25.00%	75.00%	0
Highest	0	0	0	100%

Proportion of total firms changing class by

- 1 Size Class	0 Size Class	+1	+2	+3
3.57%	46.42%	46.42%	3.57%	

C Indian Subsidiaries 1966-1971

	Closing Size			
Opening Size	Lowest	Sec. Lowest	Sec. Highest	Highest
Lowest	20%	50%	10%	20%
Second Lowest	0	46.6%	40%	13.4%
Sec. Highest	0	14.3%	71.4%	14.3%
Highest				100%

Proportion of total firms changing size classes by

- 1 Size Class	0 Size Class	+1	+2	+3
2.1%	60.82%	23.91%	6.52%	4.34%

In the matrix information is given about the proportion of firms that remained in the same size class or changed size classes over the period under study. It is seen for example that of the public firms in the lowest size class, 42.8 per cent moved up by one size class: 19 per cent by two size classes and 9.5 per cent by three size classes. Thus it is seen that the majority of the firm (i.e. 57.2 per cent) moved up from this size class. As against this, of the firms that were in the second highest size class at the beginning of the period the majority remained in the same size class and 12.5 per cent moved up one class during this period.

The results shown in Table 10 are downward based in that the construction of the matrix does not permit firms that were in the highest size class at the beginning of the period to move up: 8 public firms in this size class had more than doubled their net assets by the end of the period. If these firms are moved up to a "highest plus one" size class the proportion of firms that would move up by one size class or more would be 51.92 per cent (as against 36.54 per cent as shown in the table). This would indicate that there is a significant level of internal mobility in the public firms. It is to be paticularly noted that in the second lowest size classes, firms are more likely to "switch" ranks than firms in the higher size class.

In the sample of domestic Indian firm and in the sample of subsidiaries, mobility is also seen to be significant. If the type of adjustments suggested are made to the data, it would appear that for the domestic firm sample the majority of the firms would be seen to move up by one size class or more. In the case of the subsidiaries sample however the majority of the firms would be seen to remain in the same

size class. This would mean that mobility was somewhat higher in the domestic firms - both public and private - than among subsidiaries. Among the former group smaller firms tended to grow considerably faster than the large ones.

These findings were checked by making use of Spearman's correlation coefficient. Table 17 presents the results of this exercise.

Table 11. Spearman's Correlation Coefficient for firms ranked by opening and closing size

sample	value for r_s
Indian public firms	0.571
Indian domestic private	0.597
Indian subsidiaries	0.629
Pakistani public firms	0.93
Pakistani private firms	0.96

The lower the value of r_s the greater the relative mobility of firms within the sample. It is clear from the Table 11 that Indian public and private firms are relatively more mobile than subsidiaries. In the case of Pakistan, mobility is virtually non existent among both public and private firms. The larger firms maintain their lead and concentration is likely to have remained pronounced during the period.

Relationship of growth and profitability

Changes in industrial concentration may also be studied by anlaysing the relationship between growth and profitability. Conventional theory expects that in equilibrium no relationship will exist between growth and profitability - for in equilibrium all firms will have achieved their

optimum size and will have ceased to grow. If equilibrium does not exist the relationship between growth and profitability will be determined by the causes of disequilibrium and the speed with which firms adjust to their equilibrium position[18/]. The theory of the growth of the firm treats a firm's growth as dependent on (a) its ability to grow and (b) its willingness to grow. Profitability clearly adds to a firm's potential for growth - and, therefore, in an expanding economy a positive association between these two variables should be expected. A firm's willingness to grow, on the other hand, is likely to be related to its level of profitability in a more complicated manner. As far as public firms are concerned there may be other factors influencing growth, and the observed association between profits and growth may be a weak one within a given national sample. "Willingness to grow" may also depend as much on government policy as on demand and labour conditions in a wide range of industries. Furthermore, in as much as public firms are likely to be predominately "management controlled" (rather than "owner controlled") firms, the relationship between growth and profibability may be weak. Some authors argue that the former group of firms maximizes growth subject to a "profit satisfying" constraint. Such firms may, beyond a certain point, consciously sacrifice higher profits for higher growth[19/].

Regression analysis was employed to ascertain the relationship between growth and profitability[20/]. A very weak positive association between profitability and growth was discerned for Indian and Pakistani public firms and for the Indian subsidiary sample. On the other hand the double logarthmic models showed that firms growth was

strongly influenced by profitability in the Indian domestic firms sample. The regression coefficients here were highly significant and the value of the coefficient of determination was also high. In the case of the Pakistani private sector the double log models once again showed a significant relationship between growth and the profitability indices. The fit obtained here however was considerably worse than that for the Indian private firm data.

The low value of the coefficient of determination in the public firms and Indian subsidiaries sample may be accounted for by a significant specification error in the regression models. This may be due to heteroelasticity in the variance of the distribution of the errors in the models and/or due to the fact that the relationship between growth and profitability was not linear.

The simple models did however provide basis for acertaining that domestic private sector firms in both India and Pakistan were significantly dependent on profits as a source for financing expansion. In the case of both the public firms and the Indian subsidiaries this was clearly not the case.

There is, therfore, some justification for arguing that public firms were either growth maximizing firms and not dependent on high profit rates for growth - or else these firms did not utilize their profits for expansion. For example, for over 70 per cent of the Indian public firms the rate of growth of net assets exceeded the rate of growth of profits. It can be argued therefore that for the majority of the PMEs, profitability was not the most important determinant of growth. It is

thus clear that profitability is a longer term constraint on the Indian public firms than it is on the national private sector manufacturing firms. On the other hand it is interesting to note that in the Indian subsidiaries sample - when association between growth and profitability has been shown to be weak the rate of growth of profit tended to exceed the rate of growth of net assets for a substantial number of firms. There was thus some evidence of the underutilization of resources internal to the firm within the subsidiary sample.

The lack of association between growth and profitability in the public firm and the subsidiaries sample once again indicates a lack of evidence about increasing industrial concentration - the firms with the highest ability to grow (as measured by the profitability indices) do not exhibit a growth performance different from the other firms in the sample.

The growth process is not explained by levels of profitability for the public firms in the present sample. Economic theory predicts that in such cases variables measuring the level of capacity utilization explain growth patterns more adequately. These theories, however, take a more restricted view of the growth process than that implied by the definition that has been used so far in this study. They are concerned with analysing changes in the level of firms investment - defined as changes in fixed assets - over a period of time. The next section uses the theoretical framework developed by these theories to examine the investment behaviour of public and private firms.

Determinants of investment behaviour.

A theory of investment behaviour must concern itself with an explanation of the factors that induce a firm to increase its demand for capital equipment, and the factors which influence the availability of funds for investment purposes. The former may be looked upon as a demand function, and the latter as a supply function. An adequate investment theory must aim at integrating both demand and supply factors in its explanation of changes in capital expenditure. The distinction between demand and supply factors has not usually been recognized.

Capacity utilization theories of investment have predicted that changes in capital stock are strictly proportional to the (positive) rate of change in output. It is held that investment is proportional to the difference between the desired capital stock and existing capital stock at the beginning of a period. The desired capital stock is predicted on the assumption that the current level of sales will continue into the future. This approach assumes that investment varies with output and sales. Some authors have pointed out that in the capacity-accelerator theories of investment profits have also been adequately accounted for since they are closely associated with both sales and capital stock. Capacity acceleration models have been developed by the use of complex distribution lags and a consideration of irreversibilities. However, the basic framework has remained largely unchanged. The main alternative to the capacity-utilization theories of investment are the profit theories. These may broadly be divided into two: those which hold that investment

depends on present profit rates as these reflect future profits, and those which postulate a linear relationship between profits and sales and hence consider the profit theories to be subsidiary hypothesis under the capacity-utilization theories. Some theories also take into account market imperfections, etc., and hypothesis that the investment rate will be restricted mainly to gross profit levels.

The investment behaviour of the firms in the present sample has been analysed by fitting a number of single equation regression models to the data. It has not been possible to use any but the simplest specifications. The most important drawback of the models is the inability to experiment with a number of distributed lag systems which may allow a better specification of the relationship between investment and the independent variables included in the model. Moreover it was not possible to take asset appreciation or other price changes into consideration.

The "capacity utilization" models have regressed sales, capital stock, and the ratio of sales to capital stock (which is a measure of capital intensity) on investment. In the "profit models" profits after taxes, fixed assets and the capital intensity indicator have been regressed on changes in capital stock. Equations combining the capacity utilization and profit models have been estimated. The specification of the models are along conventional generally accepted lines.[21/] In all 13 models were applied to the annual cross section data for the period 1973/74 - 1978/79 for the Indian public domestic private and subsidiary firm data and for the period 1973-1977 for the Pakistani public and private firm. Some salient features of this exercise are summarized in Table 12.

It is clear that capacity utilization models provide a better

Table 12. Investment behaviour of public and private enterprises India and Pakistan, summary of results

	India			Pakistan	
	public	domestic private	subsidiaries	public	private
Largest R^2 obtained for capacity utilization model	0.97	0.83	0.86	0.99	0.71
Largest R^2 obtained for profit model	0.61	0.98	0.84	0.41	0.84
Largest R^2 obtained for combined model	0.82	0.87	0.80	0.46	0.81
Proportion of significant sales coefficients	88%	72%	94%	72%	78%
Proportion of significant capital stock coefficients	84%	80%	86%	86%	61%
Proportion of significant capital intensity coefficients	35%	20%	88%	52%	18%
Proportion of significant profit coefficients	17%	64%	11%	6%	74%

estimate of variations in inter firm investment rates for Indian and Pakistani public firms and subsidiaries. The profit coefficients are generally not significantly different from zero. These results differ from studies of Indian private sector enterprises.

For the period 1962-1970 Krishnamurty and Sastry have analysed the behaviour of about 360 Indian firms in a number of industries and have come to this conclusion: "In the capital goods sector the cross section results suggest the importance of financial variables, (but) accelerator estimates do not seem to have any impact at all".[22/] Other studies of private sector firms in India have found that although capacity utilization variables have been shown to be associated with growth in capital stock,[23/] financial variables are also important determinants of the investment decision. Our own findings also show that a high proportion of profit coefficients are significant in the investment models applied to data on private sector firms in both India and Pakistan. As against this profit coefficients were rarely statistically significant, for public firms and Indian subsidiaries; here it seems as if short term profitability is not as major a factor influencing investment behaviour as is the case for national private sector manufacturing enterprises. For both public firms and subsidiaries demand factors are important. Their investment expands in response to domestic market conditions and short run profitability is clearly not a binding constraint on their ability to take advantage of buoyant demand. There are likely to be differences in the resources available to public firms on the one hand and TNC subsidiaries on the other, but the preceeding analysis provides some evidence for the view that both groups do in fact mobilize these resources in response to changing demand conditions.

This means that within the context of the Indian socio-political environment both public firms and subsidiaries may legitimately be viewed as "economic" actors. Political pressures limit the ability of public firms to pursue "economic" objectives. The need for achieving vertical integration over a wide range of internationally dispersed activities and the need for maximizing surplus over this whole range similarly limit the subsidiaries ability to pursue profit or growth maximization within the host domestic economy. But these constraints do not so completely overshadow economic considerations that a relationship between the decision to invest within the domestic economy and prevalent market conditions is totally obscured. Both public firms and subsidiaries undertake investment in response to growth in domestic market demand. There may be many developing countries - many "intermediate regimes" in Kalecki's termonology - in which such a relationship may not obtain for either public firms or TNC subsidiaries. Thus in the case of Thailand it has been shown that the investment behaviour of the largest 20 TNC subsidiaries could not adequately be explained by the accelator, profit or combined models.[24/] This indicates that changes in capacity utilization and profit is not shown to influence the level of investment. It is interesting to note that a better fit for the data on Thai-national firms is obtained by the combined models. The fit obtained for the data is significantly superior to that obtained for the subsidiaries. Moreover, both profit and capacity utilization estimations are found to have a significant impact on investment.[25/] In India and Pakistan investment by both public firms and TNC subsidiaries can

be adequately explained by conventional microeconomic investment theory but profitability levels do not play an important part in determining the investment behaviour of these firms.

Patterns of profitability

So far, systematic variations in profitability in the public firms and the Indian subsidiary sample have not adequately been accounted for in this paper. The theory of the growth of the firm emphasizes the relationship between profits and the size of the firm. If a positive relationship can be established or if the dispersion of profits can be shown to decline systematically with size, then it can be argued that higher profits provide an incentive for growth. If there is no systematic variation of profits with size, profitability will not provide an incentive for expansion. For the public sector firms it appears that there is no clear association between profitability and size in any of the groups of the Indian firms. The variability of profitability does seem to be influenced by size however in the Indian public firm sample. The standard deviation of the rate of return on equity assets measure in the lowest size class is significantly different from the standard deviation of all other size classes. It is thus clear that the variability of profits is highest in the lowest size class. Firms in the higher size classes clearly enjoy a greater stability. In the case of Pakistan, there was no association between profitability and size in the public firms sample but larger private firms tended to have higher profit

rates, and the variation of profitability was lowest in the highest size class. The regression models clearly showed that size was an important determinant of profitability for the Pakistani private sector firms.

It is clear that size is not a prime determinant of the inter-firm variations in profitability for the public firm in our sample. An attempt was also made to relate profitability to the set of variables which describe financing patterns. The main findings are that in the Indian public firm sample all measures of profitability are significantly negatively related to the gearing and borrowing ratios. This would indicate that Indian public firms which generally rely on internal resources achieve relatively high levels of profit. As against this, the larger borrowers do not perhaps utilize these funds very effectively and access to credit does not sometimes ensure that existing opportunities to earn profits will be realized. It was found that the growth of a firm in the public manufacturing sector was significantly associated with high values of the borrowing and gearing ratios. Rapidly growing Indian public firms thus had relatively easy access to credit and relied upon it to finance growth. However, since there is no significant positive association between growth and size, Indian public firms which are large borrowers need not necessarily be the larger firms within the sample. The association between size and level of borrowing undertaken was found to be very low. In the Pakistani public firms sample, very little evidence of a systematic relationship between profits and the financial variable emerges; this is largely due to the relatively large number of negative profit rates recorded in the sample. In the Pakistani private

firms sample, on the other hand, a clear and close association is evident between the profitability indicators on the one hand and the external financing variables on the other. This would suggest a relatively efficient utilization of credit by these firms. In the Indian domestic firms sample, the pattern observed was similar with a strong association between profitability and the external financing indicators. In the subsidiaries sample, the only significant association is between profitability and the dividend ratio. This indicates the importance of equity resources. Profitability is not significantly associated with other internal and external financial measures in this group of firms.

Finally, an attempt was made to determine persistency of profits. If a firm enjoys monopoly power or possesses superior management resources, it could be expected that it would remain relatively more profitable over a period of time. Persistency of profitability was estimated by a simple linear regression model. This equation was fitted to the Indian public firms sample. A weak positive relationship was discerned. Further, Spearman's rank correlation coefficient[26/] for firms ranked by the profitability indices in the first and last years of the period under study was 0.497 for the Indian public firms. It is clear, therefore, that persistency of profits was relatively moderate. The Spearman coefficient for the Indian domestic manufacturing firms ranked by profitability for the first and last years of the same time period was 0.399 - not significantly different from the estimate for Indian public firms. For the group of Indian subsidiaries, the value of Spearman's correlation coefficient between firms ranked by profitability at the

beginning and end of a five-year period is 0.422. These two results are not directly comparable with the estimate of persistency of profitability for the present sample of PMEs, as they relate to a different time period. If this difference is ignored, however, there seems to be some evidence that modest persistency of profitability characterizes all three groups of firms in the Indian manufacturing sector.

The general conclusion that emerges is that conventional analysis is not a particularly adequate tool for explaining differences in levels of profitability of public firms.[27/] Similar conclusions apply to an analysis of the profitability of subsidiaries. On the other hand, a number of studies of corporate profitability of private Indian firms - including our own - has shown a significant association between profitability indicators and financing variables. The results obtained for Pakistan are also broadly similar. Thus, conventional theory does seem to provide an adequate framework for an analysis of profitability variations among private manufacturing firms in India.

Summary of evidence of public and private enterprise behaviour

We have been concerned with assessing the policies of the Indian and Pakistani public manufacturing sector and in comparing these policies with the policies of other manufacturing firms operating in India and Pakistan. The main conclusions may be summarized as follows:

1. It was found that the growth of the public firms had a modest negative impact on levels of industrial concentration in India. There is some evidence that overall levels of industrial concentration have been declining in India. However, this decline has to be seen in perspective. Up to the year 1979-1980, the top ten Indian public mining and manufacturing companies accounted for about 57 per cent of total public firm investment.[28/] Thus, although concentration remains pronounced, there are some tendencies at work which are gradually reducing its level. The Government's current commitment to fostering competition within the public sector as well as between public and private enterprise is likely to accentuate the currently modest trend towards reduction in the level of industrial concentration.

In the case of Pakistan, on the other hand, our findings sugest that the level of industrial concentration continued to increase under the Bhutto administration. This is particularly true in the case of the private firms where the larger firms tended to grow considerably faster than the smaller ones. The dispersion of growth rates among public firms in Pakistan was less pronounced, however.

2. It is also shown that the determinants of the investment behaviour of public firms can be identified by conventional micro-econometric analysis. Specifically accelator models have provided the best explanation of PME investment. These models show that domestic demand factors are important influences in determining the level of PME investment. These models have also been found to best explain the investment behaviour of subsidiaries located in India.[29/] On the

other hand profitability indicators did not emerge as significant determinants of the investment patterns of either the public firms or the Indian subsidiaries. Investment by private domestic manufacturing firms in both India and Pakistan is strongly influenced by profitability. It would, therefore, seem to be the case that profits are less of a constraint on investment expansion by PMEs and by Indian subsidiaries than on the investment behaviour of private manufacturing enterprises.

3. Similarities in the behaviour of Indian public firms and Indian subsidiaries also become evident when attention is focussed on the determinants of profitability. For both groups profitability is not closely associated with either growth or size. As against this in the domestic private manufacturing firms sample profits are clearly an important factor enchancing a firm's "willingness to grow" and augmenting its "ability to grow". In the case of the subsidiaries the low association between growth and profitability may in part be attributed to the existence of some elements of transfer pricing.[30/] As far as the public firms are concerned the generally low association between profits and other variables may be accounted for by the fact that profits have not been a major source of investment finance and have also not been taken to be the main indicator of ability to deploy investment funds. It is now widely argued that over the 1970s but also in the past - considerations of profitability have often been ignored when planning expansion within the Indian and Pakistan public sector. The present results broadly confirm this view. However, this study also shows that

non economic factors were not the main influence determining public firms investment expansion. This expansion was strongly related to domestic market conditions and much of it was in response to whether increasing opportunities. Whether the opportunities were exploited "efficiently" a question which has not been raised in this paper.

4. It is important to emphasize that the question of economic performance of public manufacturing enterprises in India and Pakistan has not been tackled in this paper. Such an assessment requires:

i) the existence of a set of "correct" indicators of the financial performance of public manufacturing enterprises;

ii) enterprise level figures for private firms in similar industries covering the same time period.

A lack of relevant statistics induced us to abandon any attempt at performance evaluation. Our finding that in many respects public manufacturing firms and subsidiaries pursued similar investment policies led us to consider possibilities for co-operation between these enterprises. This has been attempted in the following chapter.

Notes
Chapter II.

1/ The major writings in this area are those of Edith Penrose: The Theory of the Growth of the Firm, Oxford University Press, London, 1959; R.L. Marris, Economic Theory of Managerial Capitalism, Cambridge University Press, London, 1964; Myron Gordon, the Investment, Financing and Valuation of the Corporation, Irwin Press, Illinois, 1962; O. Williamson, The Economics of Discretionary Behaviour: Managerial Objectives in a Theory of the Firm, Yale University Press, Englewood Cliffs, N.J. 1964; and J. Steindl, Random Processes and the Growth of the Firm, Allen and Unwin, London, 1965; P. Hart and S. Prais, "The analysis of business concentration: a statistical approach", Jounal of the Royal Statistical Society, series A, 1956, pp.150-181; T. Barna, Investment and Growth Policies in British Industrial Firms, Cambridge University Press, London 1962; H. Simon and G. Bonini, "The size distribution of business firms", American Economic Review, September 1958, pp.607-617. S. Hymer and B. Pashigan, "Firm size and the rate of growth", The Journal of Political Economy, December 1962, pp.556-569; and E. Mansfield, "Entry, Gibrat's Law, innovation and the growth of firms", American Economic Review, December 1962, pp.1023-1051. A. Singh, Takeovers, Cambridge University Press, London, 1971; G. Whittington, Prediction and Profitability, Cambridge University Press, London, 1971; J. Palmer, "The profit variability effect of the managerial enterprise", Western Economic Journal, 1973; E. Kuhl, Capital Stock Growth: A Microeconometric Approach, North Holland, Amsterdam, 1963. A. Singh and G. Whittington, Growth Profitability and Valuation, Cambridge University Press, London, 1968.

2/ The annual balance sheets and the flow of funds statements may contain other defects. See: H. Rose, "Disclosure in Company Accounts", Institute of Economic Affairs, London, 1965 and F.W. Paish Business Finance, Pitman, London, 1965. On how some of the problems can be tackled, see: C.A. Wilk, Accounting for Inflation, Sweet and Maxwll, London, 1960.

3/ Singh and Whittington, op. cit., (1968), p.221.

4/ Bureau of Public Enterprise, Public Enterprise Survey, New Dehli, (Various).

5/ These categories are used by our data source, see. e.g. Bureau of Public Enterprise, Public Enterprise Survey 1978-79, New Delhi, Vol.3, 1979, p.10.

6/ Other than enterprises producing textiles.

7/ This is offset by the fact that since 1978 attempts have been made to delegate greater authority to the companies which had been part of the State Authority of India Ltd. but were subsidiaries reconstituted as independent companies. See: Government of India Public Enterprise Survey, 1978-79 p.1.

8/ For a review of developments in the theory of the growth of the firms see references in footnote 1/, Chapter II.

9/ Gibrat's Law suggests that the technology and market demand will not generate an optimal size of a "typical" firm. But this may not necessarily mean that individual firms within an industry do not have optimum induced sizes.

10/ Some economists have countered with the opinion that firms of medium size tend to grow faster than either small or very large firms while others maintain that firms' "willingness to grow" beyond a certain size may be reduced because of the nature of the association between growth and profitability.

11/ For a specification of the models used see Singh and Whittington, op. cit., p.113.

12/ This equation could be estimated for firms with postive growth rates.

13/ S. Sinigh and G. Whittington, Growth, Profitability and Valuation, Cambridge University Press, London, p.72.

14/ M. Kalecki, "On the Gibrat Distribution", Econometrica, 1945, p.71-83.

15/ The Welch-Aspin test was used. This test does not assume aquantance of growth rates in different size classes. See, A.C. Aspin and B.C. Welch, "Tables for use in comparisons whose accuracy involves two variances", Biometrika vol.36, 1949, p.290-296.

16/ The standard F test for testing significance of differences in variances was applied.

17/ A similar exercise could not be conducted for the Pakistani data due to the smallness of the number of public firms for which data was available.

18/ R. Marris, Economic Theory of Managerial Capitalism, Cambridge University Press, London, 1964, Chapter 2.

19/ Marris, R., op. cit., Chapter II.

20/ A specification of the models used is given in Singh and Wittington op. cit., p.150.

21/ They are primarly based on Kuh's work. E. Kuh, Capital Stock Growth: A Microeconometric Approach, North Holland, Amsterdam, 1963.

22/ K. Krishnamurty and D.N. Sastry, Investment Accelerator and Financial Factor; Institute of Economic Growth, Delhi 1973, p.129.

23/ D.N. Sastry, Investment Behaviour in the Capital Goods Industry, January 1981.

24/ UNIDO Industrial Development Survey 1981 (forthcoming), Chapter 5.

25/ UNIDO Survey 1981, Chapter 5.

26/ For an explanation of r_s see footnote 1/, Chapter 1.

27/ These results are not at variance with those of other researchers. One study finds relatively few statistically significant regression coefficients in an analysis of the impact of financial policy on profitability levels in a sample of Indian and Colombian subsidiaries.

28/ The Financial Times, 19 January, 1981.

29/ For which data was available for an earlier period however.

30/ This has been argued in some detail in UNIDO Survey 1981, Chapter 5.

III. PROBLEMS AND PROSPECTS OF CO-OPERATION BETWEEN TRANSNATIONALS AND PUBLIC MANUFACTURING ENTERPRISE

Public enterprise have sought co-operation with transnationals for various reasons. In some cases the main objective was to acquire efficient production technologies. In other instances they have sought export outlets through the distributional and marketing channels controlled by TNCs. It has sometimes been argued that export drives by public firms are a serious threat to transnationals. It has been maintained that "TNC companies find it increasingly difficult to compete against state owned companies that are not required to earn profits and that receive numerous direct and indirect subsidies from their governments".[1] In this view, public firms need have "no fear of loss or bankruptcy", "no need to pay dividends" and enjoy monopolistic domination in product markets.[2] However, export success has been limited by the inability of public firms based in the Third World to tailor products to suit foreign markets or to commit large sums of money to advertisement and marketing. Export expansion has sometimes been sought through bilateral deals with other state enterprises. For example, agreements between Middle Eastern based oil producers and European state firms regulating the exchange of oil for technology have not been uncommon.[3] Such agreements have also been concluded between TNCs and state enterprises of other Third World countries.

Both TNCs and public manufacturing firms have the capacity to undertake long-term commitments. Short run profitability is less of a constraint on these firms than on the smaller domestic enterprises as our

previous analysis has shown. Public firms are particularly inclined to enter into relatively long-term regulatory agreements guaranteeing supplies or access to markets. Such arrangements can be used to overcome deficiencies created by their inability to achieve vertical integration in production and marketing activities through substantial foreign investment.[4/] TNCs are particularly advantageously placed in this respect. In industries where a wide geographical spread is of particular importance, collaboration between TNCs and public manufacturers may be of mutual advantage. Third World producers of petrochemicals and minerals usually maintain links with TNCs which operate as international distributors of these products. Thus, United States Steel is responsible for the world-wide marketing of Venezuelan state-owned iron ore, and the oil products of Middle Eastern state enterprises are usually distributed by transnationals.[5/]

Co-operation between public firms and transnationals is also evident in industrial branches where economies of scale are important yet flexibility has to be maintained. PME managers sometimes find that association with transnationals increases their autonomy with respect to their governments,[6/] and enhances the ability of their enterprises to engage in large-scale development programmes on a technological frontier.[7/]

There are a number of examples of TNC/public firm associations in Third World countries that have existed for a considerably long period. It is worthwhile to examine closely the development of this relationship within a particular industrial branch in a developing country. This will allow us to identify the costs and benefits of long-term collaboration between transnationals and public firms. We have chosen to look in some

detail at the evolving relatinship between public firms and TNCs i the Brazilian petrochemical industry.[8/] The industry has grown rapidly since the early 1960s. In 1962, petrochemicals production in Brazil was at a comparable level to that in other LDCs such as India. "By 1973 Brazil (was) already in a position similar to that of Britain in 1962"[9/]. Moreover, the expansion of the petrochemicals industry represented not "import substitution" but the creation of new industrial capacity. The rapid growth that occurred during the 1960s and the 1970s was the result of collaboration between state enterprises, TNCs and the domestic private sector.

Until the early 1960s the Brazilian petrochemical industry was composed of a state oil monopoly, Petrobas, that controlled oil refining and exploration and several TNCs - Shell and Unilever in particular - responsible for distribution. Other TNCs - Union Carbide, Kopper and Borden and Solvay - dominated the production of petrochemical products. Local firms often used these products to manufacture plastic containers, synthetic textiles and plywood. In the late 1950s it became clear that there was a rapidly growing domestic demand for basic and intermediate petrochemical products. Neither the TNCs nor Petrobras was willing to seize the opportunity and substantially expand production. Local entrepreneurs took the initiative. A domestic group, Capuava, persuaded Petrobras to establish a new wholly-owned subsidiary, Petroquisa, which was allowed to enter joint ventures with private firms on a minority basis. Capuava and Petroquisa became partners and built the Petroquimica Uniao complex. This firm then established four joint ventures with TNCs, Petroquisa and local investors. These firms were to be the main

customers of Petroquimica's output; the firms surrounding the Petroquimica complex organized themselves into a holding company - UNIPAR - in the early 1970s.

Throughout the 1970s the relative importance of Petroquisa grew while the UNIPAR group of companies has faced a series of problems. "Petroquimica Uniao had to pay the price of being a pioneer... Despite the UNIPAR group's best efforts the downstream markets were still not all ready by the time the plant came on stream... (Moreover) other problems entirely independent of petrochemicals had repercussions on the Capuave group's financial position and its ability to sustain its investment in the petrochemical industry".[10/] In 1974, Petroquisa took over Petroquimica Uniao and UNIPAR became a minority shareholder. TNCs increased their share of UNIPAR's stock at the expense of domestic capital.

Gaining confidence and experience, the state enterprise pioneered the establishment of new petrochemical complexes in Northeastern Brazil. A new subsidiary, COPENE, was created. This company was given the responsibility of building up a network of associated firms. These firms were established through the same strategy of linking state, foreign and domestic private capital that had been adopted in the creation of the UNIPAR complex. A large number of TNCs are involved in the ownership of the new petrochemical group. "In one company for example the stock is shared among a European multinational, a Japanese firm and two local firms; the process they will use is licensed from an American firm. In another case ownership is divided between a Japanese firm, Petroquisa and a Brazilian firm (which has two major American firms as shareholders; the

process to be used is to be licensed from still another American firm. Superimposed on these interconnections is the additional inter-dependency created by the fact that one firm's outputs are other firms' inputs."[11/]

The relationship between TNCs and public manufacturing firms operating in the Brazilian petrochemical industry now seems to be fairly stable. State capital has gained access to sophisticated technology, international finance and management expertise. TNCs have a secure source of raw materials. Moreover, the ability and willingness of public firms to absorb short-term losses in order to develop the production of basic raw material makes them useful partners. Finally, collaboration with public firms usually facilitates TNC dealings with other parts of the state bureaucracy. In Brazil - as in all rapidly industrializing developing countries - the state bureaucracy is deeply involved in the regulation of prices and wages of a large range of markets. Usually public firm managers know the existing "rules of the game" better than their TNC counterparts and can effectively surmount bureaucratic hurdles. TNCs entering a developing country for the first time, or TNCs contemplating expansion in a new industrial branch, find association with public firms to be of particular advantage.

The establishment of long-term organizational links between TNCs and public manufacturing enterprises on the Brazilian pattern depends upon a number of factors. First of all, the international economic environment is an important determinant of the extent to which a TNC will respond to state initiatives for the establishment of joint ventures. Brazil was particularly advantageously placed in this respect during the 1970s. She

sought foreign investment at a time when economic prospects were becoming increasingly bleak in industrialized countries. Brazil had a growing domestic market and a regime strongly committed to maintaining a strictly centralized system of wage controls.

Furthermore, collaboration between TNCs and public firms was facilitated by the existence in Brazil of a class of "burgeusia do estado" who managed the state enterprises. This technocratic managerial elite share the work ethos and the ideology of the TNC boardrooms. The Petrobras administrative system is reported to be as good as that of any major TNC. Brazilian state enterprises are as concerned with maintaining efficient operating practices as are private enterprises in Brazil. This is so despite the fact that public firms can afford to take a longer term view of investment prospects and short-term profitability is not a serious constraint.

Collaboration between TNCs and public firms does not require continuous mediation by the domestic private sector. The development of the Brazilian petrochemical industry has largely left the domestic private investors "out in the cold". Although the original initiative for expansion in this field came from a group of private entrepreneurs, neither this group nor other companies survived as major producers in the Brazilian petrochemical complex. "The curious position of the local members...is most evident when the roster of participants in the Polo do Nordeste[12/] is examined. Only about one-third of them have industrial experience in petrochemicals. The rest are banking groups, construction companies or in some cases plastics or textile firms that are the users of the products being produced."[13/] The association of

the local business groups is justified on nationalist grounds. In Brazil - a country strongly committed to a capitalist economic strategy - eliminating domestic private enterprise from the petrochemical sector might give the impression that the state was "selling out" to international capital. However, the fact that domestic private capitalists do not provide any special contribution to the industry, yet are associated with it for ideological reasons, represents an important cost that has to be borne by both the TNCs and the state producers.

Bearing these factors in mind, the Brazilian experience provides lessons for other developing countries seeking co-operation between TNCs and public manufacturing enterprises. Many are eager to attract TNCs. India, for example, has recently made substantial changes in its industrial policies in order to permit OPEC direct investment into key industrial branches.[14/] It is clear from our review of the Brazilian experience that the extent to which TNCs can be induced to accept partnership with state enterprises depends on the international environment. TNCs are most likely to be enthusiastic about such arrangements when investment opportunities in the home economies are rather limited. Furthermore, establishment of long-term co-operation between TNCs and public firms also requires that the governments of the developing countries are willing and able to create a "favourable" domestic investment climate. In the Brazilian case, wage restraints were particularly important in this respect. Moreover, co-operation at the enterprise level is also facilitated if the management of the public firm and the foreign companies share a common organizational ideology. In other words, both groups must aim at a long-run maximization of profits

or growth. It is recognized that public firms can afford to take a longer-run view of development prospects. This increases their ability to bear short-term losses. As long as commercial viability remains the overriding objective, the capability of public firms to sustain losses increases their attraction as investment partners from the point of view of the TNCs. Finally, TNCs can be attracted to collaborate with public enterprises if the latter have political leverage within the system and are capable of surmounting bureaucratic hurdles within the domestic economy.

If these conditions are fulfilled, co-operation between TNCs and public manufacturing enterprise can flourish. An industrialization strategy that emphasizes such co-operation as a cornerstone of its development programme is not necessarily efficient or equitable, however. Thus, "Brazil has no obvious comparative advantage in petrochemicals at all."[15/] The industry's rapid growth was partly due to the strict price controls applied vigorously by the Government. Industrial concentration has been high and inefficiencies in production are significant. Moreover, the industry's development had little perceptible impact on the level of employment and income distribution. "The application of this model (in Brazil) has been accompanied by increasing inequality, rising infant mortality, new outbreaks of epidemic diseases and increasing hardship for large portions of the population."[16/] Whether such costs can be accepted as "natural and inevitable" in developing countries with a more pluralistic political system remains an open question.

It is clear that co-operation between TNCs and public firms in Brazil was developed in response to growing domestic demand for petrochemical products. On the other hand, the expansion of this industry in the Middle East has been related to the desire of many countries within the region to expand exports. These countries clearly saw the need to allocate investment resources in accordance with their international comparative advantages. Thus, the Second Saudi Arabian Plan (for the period 1975/76 - 1979/80) envisaged the construction of five very large petrochemical complexes, of producing 500,000 tons of ethylene per year. It also provided for the construction of two new fertilizer plants. The Saudi public firm put in charge of these projects is the Saudi Arabian Basic Industrial Corporation (SABIC), established in 1975. SABIC is in the process of establishing agreements with Mobil, Pecten, Shell, Dow Chemical Europe, and Mitsubishi. Since none of the plants are operational as yet, the terms and conditions of association between SABIC and the TNCs are not finalized. It appears that Saudi Arabia is insisting that most joint ventures be established on a fifty-fifty basis. The insistence on shared management responsibility is particularly strong for the export-oriented projects. However, TNCs willing to invest in these projects are given generous loans at very low interest rates, and what is more important, potential partners are given the right to purchase extra quantities of crude. This increases the incentive of the oil majors to participate in manufacturing export-oriented projects even if these projects are only likely to be marginally profitable. Despite these incentives, the export-oriented projects are moving ahead very slowly and none of the major TNCs have

expressed an interst in speeding up the process. Potential political instability is a major factor inhibiting investment expansion. The interest of the TNCs may well pick up if the pioneering ventures prove to be a success or if the perception of political instability turns out to be false in the long run. But at present, the outlook for expansion within the world petrochemical industry is bleak.

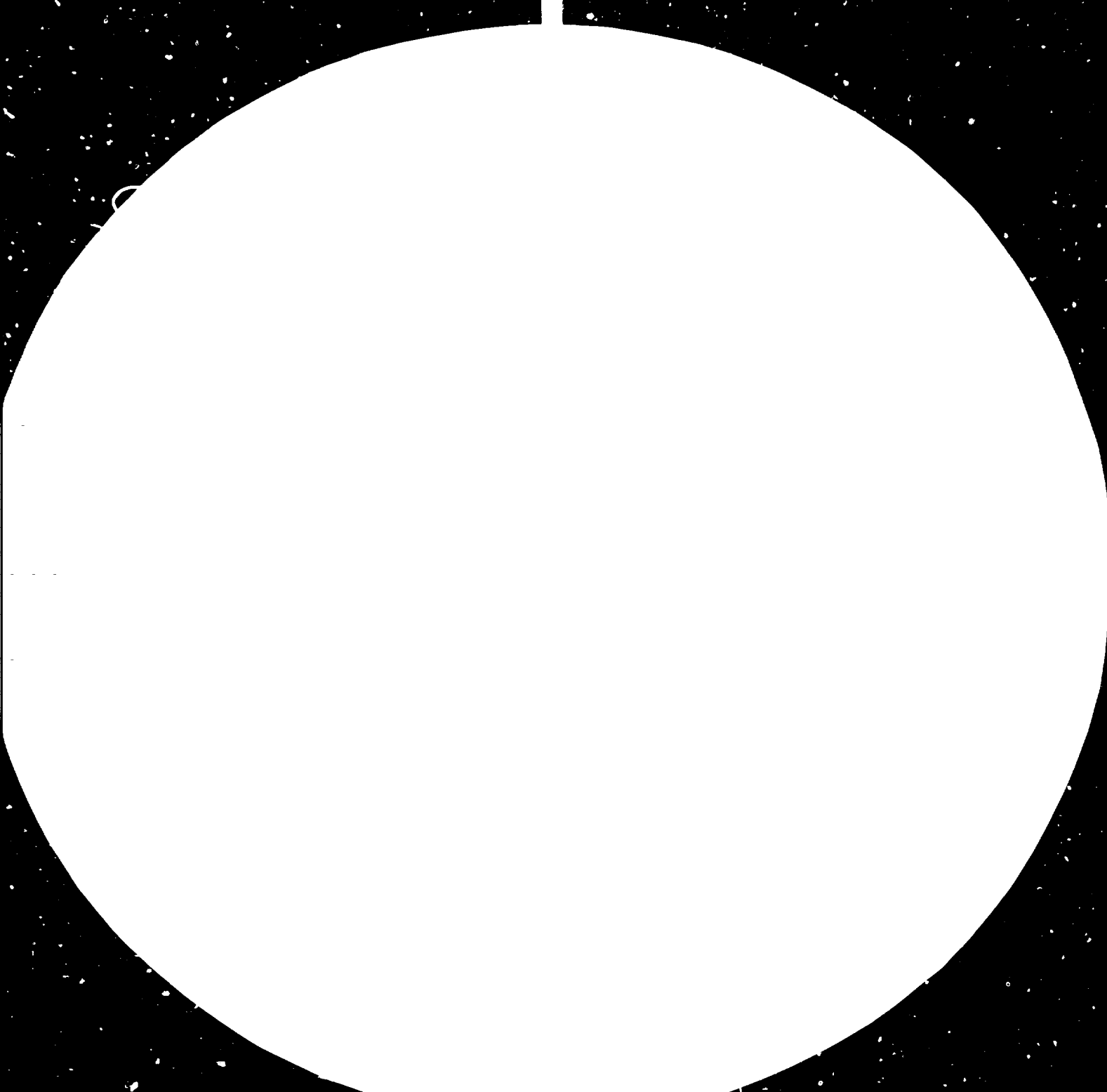
If the TNCs' interest in hydrocarbon processing industries in the Middle East does not expand, one of two responses may be expected from host governments. They may increase the level of subsidization of feedstock and capital to the foreign investor to the point that the increased costs of transport and construction are entirely offset. Such a policy of subsidization is likely to augment protectionist pressures within western markets; overcoming of these barriers will not be an easy task. Middle Eastern Governments will place increasing reliance on "favourite" TNCs (or TNC conglomerates) to breach tariff and non-tariff barriers. In such a "scenario", the public firms may gradually decline in importance as a source of management control and as a shaper of corporate strategy. It seems logical that the TNCs will argue for "an international division of labour in which the Middle Eastern countries concentrate on the production of the simpler base chemicals."[17/] This may encourage a geographical integration of the petrochemical industry which may provide a stimulus for the gradual removal of marketing barriers.

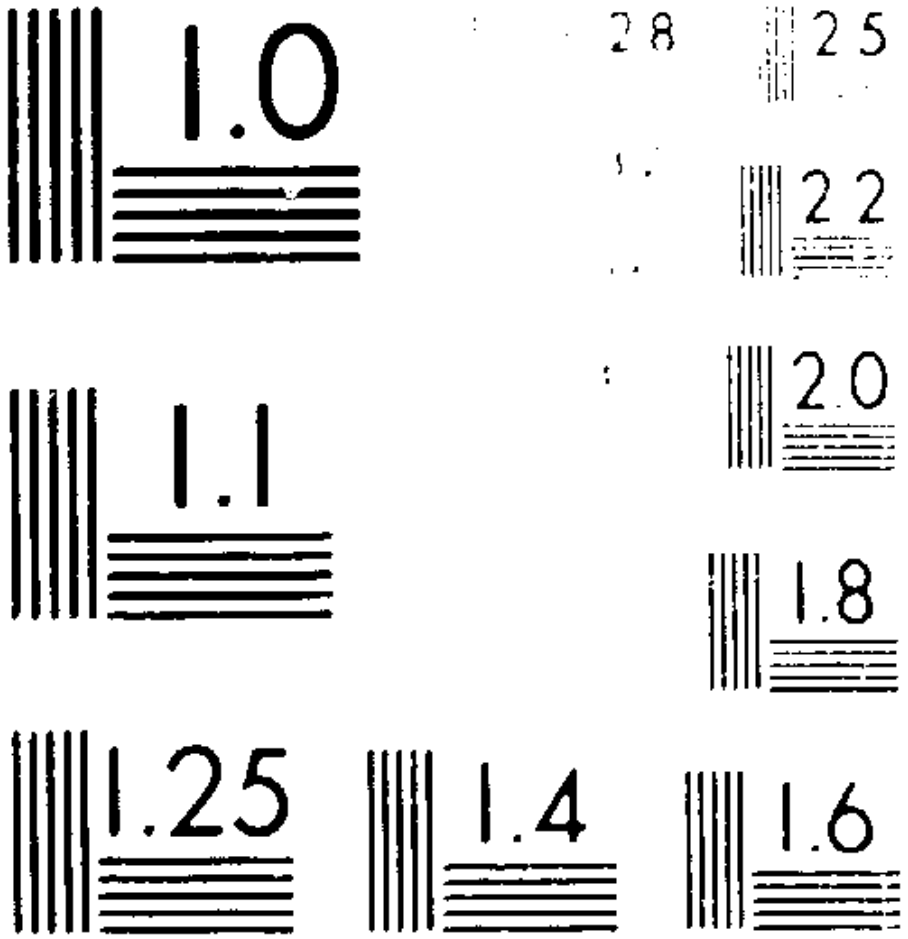
The other "scenario" envisages increased friction between Middle Eastern Governments and TNCs due to the latters' unwillingness to commit substantial investment to petrochemical plants located in these

countries. In this case, the public firm is likely to increase its influence. Its investment programme is less likely to be conditioned by short-run profitability considerations and marketing opportunities. It is likely to go for large-scale integrated petrochemical complexes since these provide the best opportunity for gaining technological and managerial experience. Its relations with TNCs will remain primarily limited to trading arrangements. This pattern has in the past been adopted by both Algeria and Iraq. Its most serious drawback is that reliance on public firms may almost inevitably limit the market access of Middle Eastern petrochemical producers in the West. It is therefore likely that Middle Eastern petrochemical producers seek to penetrate South and Southeast Asian markets and to foster regional arrangements. It is conceivable that such ventures may be of interest to both oil and chemical TNCs who have a significant investment stake in these areas.

In general, it may be argued that there is considerable potential for developing co-operation between public firms operating in developing countries. Both invest in response to changes in domestic demand considerations and are less constrained by short-run profitability considerations as the preceding analysis has shown. Even with regard to export-oriented ventures, it may be hoped that public firms (and other economic agents) can convience TNCs that increased export opportunities in specific industries can lead to a significant expansion of domestic demand in a Third World country. This may prove a viable basis for

envisaging long-term association of a form that reflects the mutual interest of both developed and developing countries. Co-operation between public manufacturing firms does, however, involve costs as well as benefits. These are likely to differ widely between projects and over time. It is, therefore, necessary that these costs and benefits be carefully evaluated by Governments before programmes of long-term associations are finalized.

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Notes

1/ K.D. Walters and R.J. Mansen, "State owned businesses abroad. New cometitive threat", Harvard Business Review, March-April 1979, pp.164-171.

2/ Walters and Mansen, op. cit., pp.164-165.

3/ L. Turner, Oil Companies in the International System, London, Allen and Unwin, 1978, p.180.

4/ Some LDC based PMFs do however invest abroad on an impressive scale.

5/ R. Vernon, The International Aspects of State Owned Enterprises, Harvard University, 1980 (mineo), p.17.

6/ A. Basant, C. Raj, Public Enterprise Investment Decisions in India, MacMillan, Delhi, 1977, p.123.

7/ A. Basant, C. Ray, op. cit., p.127.

8/ The following paragraphs rely heavily on P. Evans, "Multinationals, State Owned Corporations and the Transformation of Imperialism", Development and Cultural Change, vol.20, no.1, 1977, p.43-64.

9/ Evans, op. cit., p.45.

10/ Evans, op. cit., p.52.

11/ Evans, op. cit., p.54.

12/ The petrochemical complex in the North East.

13/ Evans, op. cit., p.60.

14/ "India Maps Out a New Strategy", Far Eastern Economic Review, Nov 7. 1980, p.68-69.

15/ Evans, op. cit., p.47.

16/ Evans, op. cit., p.64.

17/ L. Turner and J. Bedore, Middle East Industrialization, Saxon House, London, 1979, p.160.

V. IN PLACE OF A CONCLUSION

This paper has attempted to compare the impact of public and private industrial expansion on national development in the developing countries and to study the investment policies of these two groups of enterprises. At a macro level, both public and private manufacturing investment was found to have a significant and positive effect on the growth of per capita income in the developing countries. Although differences in employment policies, production technology used and export patterns were discerned, there was reason to believe that this may be accounted for by differences in the production and marketing conditions of specific industrial branches. At the micro level, important similarities were identified.

It must be clearly recognized that these conclusions are of a highly tentative character. Data available to us were of a fragmentary character, and there was little opportunity for making an attempt at reconciling its construction. It is important to emphasize the very serious limitations that the nature of the existing data imposes on attempts at international comparability. National methodologies for computing value added, gross investment and components of these figures vary considerably. In order to render these estimates comparable, it is necessary to have access to balance sheets, profit and loss statements, sources and uses of funds statements and manufacturing cost documents of the public sector industrial enterprises in the sampled countries. An examination of these documents may reveal serious discrepancies and cases of double counting in national estimates as evidenced by Leroy Jones'

study of the Korean public sector.[1] A thorough study of the impact of the public sector on national development must begin by a compilation of documents mentioned in this paragraph. Priority should therefore be given to the task of building an international data base on public industrial enterprises.

Public manufacturing enterprises have grown rapidly over the last two decades in both socialist and market-oriented developing countries. According to Malcom Gillis, "only in a very small number of natural resource exporting nations have the multinationals loomed larger in terms of investment shares, generation of value added, employment or foreign exchange. By whatever standard employed, state-owned enterprises now play a more critical role in the development process of a greater number of developing countries than do multinationals and (their) relative importance is likely to grow in the future."[2]

Increased attention should, therefore, be given to the task of developing a data base which makes a scientific comparative study possible at the global level.

Notes
Chapter IV.

1/ L. Jones, op. cit., p.62-63.

2/ M. Gillis, "The role of state enterprise in economic development", Social Research, Summer 1980, pp.248-269.

Annex I: Indicators of growth, profitability and financing variables and correction matrices: India and Pakistan

1.	Opening size	=	Net Current Assets$_t$ + Fixed Assets$_t$ after deducting depreciation
	_____ a	=	Current assets$_t$ + fixed assets at cost$_t$
2.	Closing size	=	Net current assets$_{t+1}$ + fixed assets after depreciation$_{t+1}$
	_____ a	=	Current assets$_{t+1}$ + fixed assets at cost$_{t+1}$
3.	Average size	=	(Net current assets + fixed assets after deducting depreciation)/year
4.	Rate of growth	=	$\frac{(NCA_{t+1} + FAD_{t+1}) - (NCA_t + FAD_t)}{NCA_t + FAD_{t+1}} \times 100$
5.	Rate of return on equity assets	=	(Net profit before tax -- tax provision (NRTP)/(Total capital employed -- preference shares (TCPS)) for whole period
6.	Rate of return on net assets	=	$\Sigma NPTP/\Sigma(NCA + FAD)$
7.	Net profits to sales	=	$\frac{\Sigma(\text{Net profit before tax})}{\Sigma(\text{Sales revenue})}$
8.	Dividend ratio	=	$\frac{\Sigma(\text{Total dividend payments})}{\Sigma TCPS}$
9.	Retention ratio	=	$\frac{\Sigma(NPTP - \text{dividend payments})}{\Sigma(NPTP + \text{divident payments})}$
10.	Internal finance	=	Σ(Tax provision + Depreciaiton provision + rentention funds)/Σ(Tax provision) + depreciation + rentention + ext. finance)
11.	Borrowing ratio	=	(Ext. finance)/(Ext. finance + tax provision + depreciation provision + rentention funds)
12.	Gearing ratio	=	$\frac{\text{Total fixed liabilities}}{\text{Total capital employed}} \times 100$
13.	Liquidity ratio	=	$\frac{\text{Total liquid asset}}{\Sigma NCA + \Sigma FAD}$
14.	Capital structure indicator	=	$\frac{\text{Shareholders equity}}{\text{current assets plus fixed assets at cost}}$
15.	Personal payments ratio	=	(Value added minus net positive profits)/ Capital employed
16.	Foreign finance	=	Foreign loans/ total loans

Annex I
(Page 2)

Zero order correlation matrix for indicators: Indian public sector manufacturing firm 1972-1978

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Open size	1.00	0.99	-0.08	0.96	-0.01	-0.03	0.05	-0.04	0.125	-0.07	0.046	-0.06	-0.05	-0.01	-0.05	-0.05
Average size								-0.07	0.14	-0.09	0.05	-0.03	-0.04	0.01	-0.08	-0.07
Growth			1.00	-0.03	-0.10	-0.04	0.002	-0.15	0.159	-0.08	-0.02	0.85	0.91	0.72	-0.16	0.343
Closing size				1.00	0.002	-0.004	0.712	-0.05	0.11	-0.05	0.062	-0.06	-0.049	-0.004	-0.06	-0.07
ASSAS					1.00	0.745	0.828	0.46	-0.18	0.68	-0.32	-0.19	-0.06	0.05	0.223	0.25
RSMAS						1.00	0.523	0.20	-0.06	0.40	-0.208	0.107	0.168	0.419	0.148	0.162
NFS							1.00	0.38	-0.24	0.598	-0.40	-0.12	-0.102	0.08	0.240	0.24
Div. ratio								1.00	-0.50	0.62	-0.05	-0.24	-0.15	-0.26	0.299	0.34
Retorat									1.00	-0.28	-0.289	0.191	0.127	0.234	-0.190	-0.02
Internal finance										1.00	-0.115	-0.29	-0.144	-0.144	0.18	-0.54
Borrowing											1.00	-0.05	-0.04	-0.09	-0.109	-0.257
Gearing												1.00	0.951	0.88	-0.11	0.23
Liquidity													1.00	0.881	-0.05	0.329
Capital structure														1.00	-0.07	0.213
Personal payments															1.00	0.10
Foreign finance																1.00

Annex II
(Page 31)

Zero order correlation matrix for indicators: Indian subsidiaries 1966-1971

	Opening size	Closing size	Average size	Growth	Rate of return on net assets	Rate of return on equity assets	Net profit to sales	Dividend ratio	Retention ratio	Liquidity ratio	Debt equity ratio	Factor intensity ratio
Opening size	1.00	0.69	0.82	-0.30	-0.15	-0.16	-0.15	0.05	0.07	-0.47	0.06	-0.12
Closing size		1.00	0.97	0.10	-0.28	-0.21	-0.22	-0.12	0.09	-0.51	0.13	-0.05
Average size			1.00	-0.18	-0.24	-0.20	-0.20	-0.02	0.08	-0.51	0.10	-0.03
Growth				1.00	0.000	0.18	0.12	-0.14	0.08	0.09	0.09	0.28
Rate of return on net assets					1.00	0.73	0.61	0.67	0.27	0.49	-0.35	0.07
Rate of return on equity assets						1.00	0.71	0.30	0.35	0.24	-0.23	0.55
Net profit to sales							1.00	0.34	0.21	0.08	-0.18	0.60
Dividend ratio								1.00	0.02	0.27	-0.31	-0.10
Retention ratio									1.00	-0.07	0.20	0.18
Liquidity ratio										1.00	-0.24	-0.18
Debt/equity ratio											1.00	0.02
Factor intensity ratio												1.00

Zero order correlation matrix for indicators: India domestic manufacturing firms 1966-1971

	1	2	3	4	5	6	7	8	9	10	11	12
Open	1.00	0.95	0.98	-0.28	0.04	0.10	0.17	-0.07	0.05	-0.42	-0.03	0.48
Close		1.00	0.98	-0.08	0.11	0.20	0.28	-0.00	0.10	-0.51	0.04	0.54
Average size			1.00	-0.19	0.08	0.16	0.22	-0.03	0.08	-0.48	0.00	0.52
Growth				1.00	0.24	0.28	0.26	0.22	0.11	-0.11	0.29	0.08
Rate of retention on net assets					1.00	0.83	0.60	0.39	-0.22	0.11	0.80	0.25
RRNA						1.00	0.69	0.39	0.11	-0.16	0.54	0.51
NPS							1.00	0.34	0.40	-0.45	0.00	0.73
Dividend ratio								1.00	0.03	-0.07	0.23	0.04
Retention ratio									1.00	-0.33	-0.29	0.14
Liquidity										1.00	0.25	-0.56
Debt equity											1.00	0.05
Factor intensity												1.00

Annex 1 (cont'd)

Zero order correlation for indicators: private sector Pakistan

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Opening	1.00	0.99	0.98	0.31	0.41	0.39	0.31	0.21	0.11	-0.07	0.41	0.03	0.11	0.17	0.29
Closing		1.00	0.97	0.37	0.42	0.40	0.34	0.19	0.17	-0.10	0.37	0.01	0.09	0.11	0.27
Average size			1.00	0.35	0.35	0.45	0.31	0.11	0.18	-0.21	0.35	0.06	0.08	0.15	0.21
Growth				1.00	0.68	0.74	0.71	0.31	0.36	0.41	0.71	0.56	0.20	0.19	0.46
Rate of return on equity assets					1.00	0.87	0.81	0.21	0.34	0.34	0.52	0.50	0.46	0.13	0.08
Rate of returne on net assets						1.00	0.79	0.13	0.39	0.41	0.42	0.39	0.61	0.09	0.11
Net profit to sales							1.00	0.17	0.41	0.31	0.37	0.48	0.41	0.06	0.13
Dividend ratio								1.00	0.21	0.32	0.04	-0.06	0.11	0.09	0.14
Retention ratio									1.00	0.43	0.06	0.11	0.09	0.09	0.10
Internal finance										1.00	0.04	-0.13	0.09	0.16	0.17
Borrowing											1.00	0.37	0.24	0.38	0.51
Gearing												1.00	0.27	0.41	0.37
Liquidity ratio													1.00	0.19	0.17
Capital structure														1.00	0.31
Factor intensity															1.00

Annex 1 (page 5)

Zero order correlation for indicators: Public sector Pakistan

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Opening	1.00	0.94	0.97	0.08	0.05	0.08	0.11	0.09	0.06	0.57	-0.07	0.61	0.21	0.30	0.50
Closing		1.00	0.98	0.01	0.04	0.09	0.17	0 09	0.04	0.50	-0.11	0.67	0.17	0.16	0.41
Average size			1.00	0.05	0.06	0.13	0.07	0.10	0.09	0.37	-0.12	0.52	0.23	0.28	0.49
Growth				1.00	0.19	0.20	0.17	0.24	0.01	0.09	0.42	0.39	0.31	0.30	0.09
Rate of return on equity assets					1.00	0.97	0.78	0.27	0.11	0.03	-0.24	-0.19	0.08	0.18	0.08
Rate of return on net assets						1.00	0.87	0.33	0.17	0.09	-0.30	-0.17	0.09	0.17	0.07
Net profit to sales							1.00	0.21	0.15	0.06	-0.41	-0.18	0.03	0.12	0.10
Dividend ratio								1.00	0.23	0.51	0.06	0.11	0.17	0.56	-0.14
Retention ratio									1.00	0.71	-0.07	0.04	0.14	0.20	0.06
Internal finance										1.00	-0.31	-3.39	0.08	0.17	0.16
Borrowing											1.00	0.61	0.37	0.41	0.18
Gearing												1.00	0.51	0.31	0.19
Liquidity ratio													1.00	0.23	0.18
Capital structure														1.00	0.09
Factor intensity															1.00

Annex I (Para 5)