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**COMPETITION AND
CONCENTRATION IN THE
MANUFACTURING SECTOR
DURING THE FIRST FIVE YEAR
IRANIAN ECONOMIC PLAN**

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Competition and Concentration in the Manufacturing Sector During the First Five Year Iranian Economic Plan

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Abstract

Increasing private sector participation in economic activities and promoting competition were the First Year Socio-Economic Plan of Iran. This paper examines the changes in market structure and the size of government during this plan. By considering Concentration ratio as a proxy measure for the size of monopoly and competition, we found the manufacturing sector of the Iranian economy was highly concentrated in the beginning as well as at the end of the First Economic Plan. Furthermore, the share of government in economic activities increased during this plan, which is in contrast to the targets established in the plan and to the Iranian Structural Adjustment Programme.

I INTRODUCTION

In 1978 while a considerable number of countries pursued privatization, deregulation, liberalization and the elimination of various price distortions, Iran was expanding its already large public sector. Three factors account for this tendency: firstly the 1978 Islamic Revolution with its goal of social justice, secondly the income from oil, which is exclusively owned by government, and thirdly the Iraq-imposed war against Iran.

Immediately after the revolution the government embarked on a wave of nationalization including heavy industries, banking and insurance. Under the influence of the revolution it was widely believed that a large public sector and widespread subsidies would achieve social justice and more widespread economic welfare. The income from oil exports was another important driving force for nationalization. The oil fields had been owned by the government since the oil industry began in Iran and the government has exclusive rights over the discovery and extraction of oil. The condition of the Iranian oil industry had not changed since the revolution. The income from oil exports was captured by the

government, which in turn encouraged the revolutionary-minded public manager to expand the public sector beyond that of before 1978. The Iraq war against Iran caused a large increase in subsidies of basic food and public utilities. Items such as bread, sugar, rice, eggs, butter, red meat, milk, vegetable oil, public transport, water, electricity, gas, and gasoline were among those subsidized. So were many agriculture and manufacturing inputs. To guarantee nationwide access to low priced bread, a huge amount of wheat was imported annually, which imposed a severe burden on the government budget as well as on the balance of payments. Alongside the Government Trade Company (GTC), which imported food items in large scale, new public companies affiliated to the Ministry of Commerce were founded to import and produce other items. Not only was each of these three factors independently responsible for a larger public sector, but their effects reinforced each other and led to more state intervention in the economy. For example, both the state's exclusive access to income from oil and the equity goals of the revolution facilitated widespread subsidies and encouraged state intervention.

Shortly after establishing the new regime, a new constitution was prepared by a body of elected experts and was immediately approved by a referendum. The revolutionary goals of justice and equity have strongly affected the new constitution. According to Provision 44 of the new constitution the state has exclusive rights to act in numerous economic sectors such as heavy industries, mining, foreign trade, banking, electricity, water, dams and irrigation, insurance, communication, aviation, navigation and railways.

Conglomerates such as the Industrial Development and Renovation Organization (IDR), and the National Iranian Industries Organization (NIIO), along with firms affiliated to the state-owned bank dominated the manufacturing sector of Iran. In addition, new quasi public charity organizations were founded to help vulnerable groups and certain households who had lost one or more family members during the challenge against the former regime. These quasi-public organizations, through establishing new firms and branches across the country, were able to monopolise economic activities. To monopolise foreign trade, the government established a number of public firms named 'centre(s) for procurement and the distribution of goods'. Each of these centres had the exclusive right to import certain goods. Widespread subsidies, which had adverse effects on the private sector, were another aspect of the government's intensive intervention in the economy. Financing the resources required to protect vulnerable groups burdened both the budget deficit and the balance of payments.

For many years Iran was the world's largest importer of wheat. The subsidies programme was not well targeted. All households enjoyed the subsidies. What is more, the rich could enjoy this programme more than the poor. Despite the advantages of access to easy credit and foreign exchange and various forms of protection, the state-owned firms made huge losses every year because of X-inefficiency and poor management. Since the rate of foreign exchange was officially determined, both public and private firms had a great incentive to import various kinds of goods such as raw material, final consumer and producer goods. Despite unemployment being a severe problem for the Iranian economy, many new firms with capital-intensive technology were established. But much of the new equipment and capital goods were idle owing to the lack of knowledge and skills to work them. Furthermore, much of the equipment, which was imported by managers of public firms, was not compatible with their firms' existing technology and so remained idle. Therefore X-inefficiency dominated the whole economy, particularly state-owned firms.

In response to various distortions in the Iranian economy a new programme of structural adjustment was accepted by the Iranian political and economic authorities in 1988. It was expected that, by enforcing the new economic programme, many problems of the Iranian economy, such as distortions of relative prices, would be eliminated. Increasing the role and place of private sector through privatization; floating the rate of foreign exchange; targeting protection on vulnerable households and eliminating various price distortions, as well as eliminating monopolies, were amongst the objectives of the structural adjustment programme in Iran.

Regardless of the government's success or failure in achieving other objectives, this paper focuses on the elimination of the public-firm monopoly and increasing the participation of the private sector in economic activities. These were among the objectives of the structural adjustment programme and were emphasised in all Five Year Economic Plans of Iran. Indeed the whole of chapter four of the law of the third Five Year Economic Plan of Iran was about regulating monopolies and increasing the degree of competitiveness of the Iranian economy. According to Provision 35 of this legislation, the government was obliged to eliminate all monopolies except those specifically permitted by the constitution.

The organisation of this paper is as follows. In the next section, data is discussed. In the third and fourth sections the market concentration in Iranian 4-digit industries are analysed.

The influence of state-owned firms on market concentration will be assessed in the fifth section. The last section is devoted to the conclusion.

II DATA

The statistical centre of Iran is officially in charge of collecting the data related to the manufacturing sector. The measurement of market concentration indices is highly dependent on firm level information about sales, production, value added and employment. By using such information for the period 1989-1994, market concentrations will be calculated. In 1994, more than 12,000 firms (with 10 or more employees) were involved in manufacturing activities. On the basis of ISIC categories, the firms in Iran's manufacturing sector were classified into 81 '4-digit industries'.

III CONCENTRATION IN THE MANUFACTURING SECTOR

So far, there has been an extensive discussion about monopoly in the Iranian economy, but far too little attention has been paid to assessing the degree of monopoly through measurable indices. To date various methods have been developed and introduced in the literature to measure competition and monopoly power, (Bain, Rothchild, Lerner, Papandreou as quoted in Koch, 1980 and Masson, 1984). Concentration is a practical criteria which is widely used by legal institutions. For example in the US, since 1966-1980, horizontal mergers were usually stopped if the resulting firm would have more than 15 percent of the market (Shepherd, 1990, p.473).

In this section it was decided to use concentration indices to evaluate the degree of monopoly in the Iranian economy. To control for possible biases we use two different indices such as n-firm concentration ratio (CR_n) and Herfindhal-Hirschman Index (H-H). The value of these indices will be calculated at the level of 4-digit industries. In addition to CR_n and H-H, aggregate concentration indices will also be applied at the level of whole manufacturing sector for a complementary discussion in the next section.

Table 1 shows the result of measuring the concentration indices for 81 industrial markets for the period from 1989 to 1994 (which is overlapped to the period of the First Five Year Economic Plan). One question that needs to be asked, however, is whether the manufacturing sector of the Iranian economy is concentrated or not. To be able to answer this question we need a criteria to evaluate the degree of concentration in the markets. It

was decided to consider markets with a concentration ratio of more than 40 percent as concentrated.

Table 1: Distribution of 4-digit industries in terms of concentration ratio

	1989		1992		1993		1994	
	No. of Industries	Share %	No. of Industries	Share %	No. of Industries	Share %	No. of Industries	Share %
CR*₄								
S CR > 40 4	66	70.1	67	77.1			65	72
V CR > 40 4	68	73.7	66	67			69	76.5
E CR > 40 4	64	49	57	50			56	51
CR*₅								
S CR > 40 5	68	70.5	72	84	69	72.6	70	77.2
V CR > 40 5	71	75	66	67.7	72	78.8	70	79
E CR > 40 5	68	61	64	56	64	59.4	61	55

- Indices has been measured by the author

* - CR₄ and CR₅ are respectively 4-firm concentration and 5-firm concentration ratio. The subscripts of S, V and E stand respectively for sale, value added and employment.

As can be shown from the table (above), for a large number of industries, the value of the concentration ratios are greater than 40 percent during the period 1989-94.

For example, CR₄^S was greater than 40 percent for 66 industries in 1989. The share of these concentrated industries of total manufacturing sales in 1989 was 70.1%.

If we consider CR₄^V instead of CR₄^S, then the number of concentrated industries and their share of total manufacturing sector value added in 1989 will increase to 68 and

73.7 percent respectively. The extent of CR₄^S and CR₄^V indicate that the number of

concentrated industries fell between 1989 and 1994. In spite of this, the share of the concentrated industries increased during the same period. On the other hand, both H^S and H^V indicate that the number of concentrated industries as well as their share in sales and value added increased during 1989 to 1994.

It was widely expected that competition in the manufacturing sector would be promoted through the implementation of the First Five Year Economic Plan. In fact this plan was the first step of structural adjustment in the Iranian economy and contained programmes such as privatization and the elimination of some state monopolies. Contrary to expectations, no great success in promoting competition was experienced. It is apparent from the data in Table 1 that the number of concentrated industries did not fall dramatically between 1989 and 1994. In addition, as can be seen from Table 1, the share of concentrated industries of terms of sales and value added of the manufacturing sector increased during the period of First Five Year Economic Plan.

Herfindhal-Hirschman (H-H) is another index widely used to measure concentration in markets. For example, in the US, to approve or reject a merger proposal, FTC applies the H-H Index (Stiglitz 1993). For a further investigation, the Herfindhal-Hirschman was applied to calculate the concentration of different markets in the manufacturing sector of the Iranian economy in 1994. The results obtained are shown in Table 2.

Table 2: Distribution of 4-digit industries in terms of H-H Index

	H^S		H^V		H^E	
	No.	Share	No.	Share	No.	Share
H < 1000	33	50.19%	28	40.81%	37	65.29%
1000 < H < 1800	17	34.02%	16	19.41%	20	19.3%
H > 1800	29	15.79%	36	39.7%	23	15.4%

On the basis of the values of H^S , industries may be divided into low, mild and highly concentrated. As shown in the table above, in 1994, 46 of the 4-digit industries were concentrated and 48.91 percent of manufacturing sales were under their control.

Considering value added, the number of concentrated industries and their share increases to 52 and 59.1 percent respectively.

The data in Tables 1 and 2 reveal that the manufacturing sector of the Iranian economy is highly concentrated and the implementation of the First Five Year Economic Plan led to no significant changes in concentration ratios or to the share of concentrated industries in terms of sales and value added. In the next section, by introducing supplementary indices, we will show that concentration in the manufacturing sector did not change dramatically during the First Five Year Economic Plan.

IV AGGREGATE CONCENTRATION

In the previous section, the concentration levels in individual markets were considered. In this section an attempt has been made to calculate a single value of concentration for the whole manufacturing sector of the Iranian economy. To this end a weighted average of the concentration ratio was considered:

$$C_5 = \sum_i^{81} CR_{5,i} W_i$$

Where C_5 stands for the weighted average of the 5-firm concentration ratio; $CR_{5,i}$ is the 5 firm concentration ratio in the i th industry and W_i is the share of the i th industry in total manufacturing sector sales (value added or employment) (Sawyer, 1971, pp.52-83). Table 3 shows the value of the sector aggregate concentration in terms of various variables such as sales, value added and employment for the period 1989 to 1994.

Table 3: Manufacturing sector aggregate concentration

Year	S C 5	V C 5	E C 5
1989	60.55	64	49.8
1992	58.09	55.65	48.76
1993	56.2	63.6	47.4
1994	58.77	64.5	46.3

Table 3 is quite revealing in several ways. First, from the data in this table, it is obvious that the manufacturing sector of Iran is highly concentrated. For example in 1994, C_{5}^V was 64.5, which means on average 64.5 percent of value added in each market belonged to the 5 largest firms. Second, according to C_{5}^S , aggregate concentration decreased 1.78, whereas on the basis of C_{5}^V an increase equal to 0.5 was experienced. Finally, aggregate concentration in terms of employment was smaller than that of sales and value added. This result could be explained by the fact that the largest firms in each market (most state-owned) used capital-intensive technology.

In a further investigation into the probable change of concentration in the manufacturing sector during the First Plan, other indicators were employed. These indicators are the share of 10, 20, 50, 100, 150 and 200 largest firms in total sales of the manufacturing sector. It must be noted that the largest firms are chosen on the basis of the rank of their sales (regardless of the markets they belong to). The result is shown in the following table.

Table 4: The share of n largest firms of total manufacturing sale

n largest firms	YEAR				
	1988	1991	1992	1993	1994
10	20.7		19.42	17.25	18.6
50	37.28	37.4	38.1	34.23	36.3
100	48.05	47.9	48.68	44.68	47.26
150	55.7	55	55	52.03	54.29
200	61.4	60.4	61.06	57.69	59.61
* No of firms with 10 workers and more	10245	5687	6098	5922	12987

*- variation in the number of the firms is due to variation of the sample in different years.

What is interesting in the data in Table 4 is that a small portion of the firms have a large share of the sector's sales. For example in 1994, 18.6 percent of sales belonged to only 10 firms i.e. 0.7 percent of total firms. Similarly the 200 largest firms, i.e. 1.5 percent of total firms had command over 59.6 percent of the market in the same year. Furthermore, the data in Table 4 reveals that the value of aggregate concentration during the first year of the

Economic Plan (1998) is similar to that at the end of the plan. As can be seen, the data in Table 4 supports the result derived from Tables 1-3, in the sense that the manufacturing sector was highly concentrated and no successes in promoting competition and eliminating monopoly were achieved. There are several explanations for this result. The first, and perhaps the most prominent obstacle to implementing this plan, was the resistance of interest groups in and outside of the government. A lack of a consistent and cohesive privatization programme was among the reasons for this failure.

V PUBLIC FIRMS AND MARKET CONCENTRATION

Since the income from oil exports belongs to the government and Article 44 of the new constitution facilitates government intervention in economic activities, it is to be expected that a considerable proportion of the manufacturing sector was under the exclusive control of state-owned firms. To assess the influence of the government on market concentration, the shares of the 200 largest state-owned firms in (in terms of sales, value added and employment) the manufacturing sector were investigated.

Table 5: The share of 200 largest state-owned firms in economic activities

Year	Sale (%)	Value added (%)	Employment (%)
1988	54	57	49
1990	55	57	48
1991	58	61	49
1992	61	63	52
1993	57	65	50
1994	59	66	49
1995	54.9	57.1	37.2
1996	56.7	60.7	35.5

The table above illustrates the dominance of state-owned firms in the manufacturing sector. As table 5 shows, at least 54 percent of sales, 57 percent of value added and 35.5 percent of employment of the sector belonged to just 200 of the largest state-owned firms during the period between 1988 and 1996. The share of government in the manufacturing sector would be increased if other public firms were taken into account. By comparing the share of

the 200 largest state-owned firms in the sales of the manufacturing sector (Table 5) with that of the 200 largest firms (Table 4), it can be seen that all of the 200 largest firms, which are responsible for a significant proportion of sales, value added and employment, are affiliated to government. In fact, the government could be the major factor, if not the only one, causing the highly concentrated manufacturing sector.

We now turn to the role played by state-owned firms in individual markets. The intention is to calculate the share of state-owned firms in terms of value added in each market. In Table 6, the number of industries, in which the state-owned firms have more than x percent of value added of those industries, are reported. The data in the following table reveals the growth in the number of such industries between 1989 and 1996. In 1996, the share of state-owned firms in total value added of the related industry was greater than 40 percent in 59 industries. Furthermore, the number of industries in which state-owned firms had more than 90 percent of the value added increased from 2 in 1989 to 17 in 1996. This data therefore shows the increasing role of the government in economic activities during 1989 to 1996.

Table 6: Frequency distribution of markets regarding the share of value added of state owned firms

Share of state-owned firm (%)	1989	1990	1991	1992	1993	1994	1995	1996
> 40	45	44	48	47	51	46	57	59
> 50	35	37	40	35	40	36	49	51
> 60	26	34	30	28	28	24	35	36
> 70	18	24	20	18	17	16	25	29
> 80	12	11	9	9	9	7	23	22
> 90	2	2	3	3	1	2	15	17

By comparing the share of three different agents i.e. government, private sector and the cooperative sector, the relative size of government could be more explicitly identified. Table 7 reports the share of each agent in terms of sales, value added and employment in the manufacturing sector.

**Table 7: Place of Government, Private Sector and Cooperation Sector
in Manufacturing 1996**

	State-owned firms (%)	Private Sector (%)	Cooperative Sector 1996 (%)
Sale	56.9	42.19	0.91
Value added	61.3	37.4	0.76
Employment	36	62.71	1.29

In 1996, a significant portion of sales, value added and employment of the manufacturing sector belonged to government. For example, in this year 57 percent of sales and 61.3 percent of value added were managed by state-owned firms.

All data reported in Tables 1 to 7 show the large size of government and its role in creating concentrated markets. If we include under 'government' the share of quasi-public firms in economic activities, the share of government in economy goes beyond that illustrated.

By looking at the list of highly concentrated industries, the influence of government interventions and policies in driving away competition is clarified. For example, highly concentrated industries such as metallic mineral products, manufacture of basic metals, manufacturing of machinery and equipment; manufacturing of electrical machinery and apparatus; manufacturing of radio, television and communication equipment; and manufacturing of motor vehicles are among those industries protected by government from potential competitors. Through subsidies, and the imposition of tariffs, government has protected the firms in some industries from the threat of new entrants (both domestic and international). In addition, the enforcement of licenses for new entrants and the access of the incumbents to easy credit and foreign exchange reinforce their dominant status.

VI CONCLUSION

This study set out to determine the level of concentration in the manufacturing sector of the Iranian economy. To this end, different indices of concentration such as the 4-firm and 5-firm concentration ratios, as well as Herfindhal-Hirschman indices, were employed. The value of these indices, calculated for 81 '4-digit industries', indicated that the manufacturing sector is highly concentrated. Similarly, the aggregate measure of concentration supported this result on the basis of Article 8 of the First Socio-Economic Plan of Iran. Government was

authorised to take appropriate measures to enhance the efficiency, productivity and competition to streamline the state in the area of policy making, to reduce non-sovereign undertaking of government and to transfer some state-owned enterprises to the private sector, and to promote the role and scope of the private sectors in economic activities. In contrast to the targets of the First Five Year Economic Plan (1989-1994), our findings indicated that no discernible changes in the level of concentration and promotion of competition were observed. Furthermore the share of concentrated industries in value added and sales of the manufacturing sector had increased at the end of 1994, indicating that the plan's targets were not achieved. In addition to determining the level of concentration, this paper sought to investigate the major cause of concentration. The results of this study showed that a significant part of value added, sales and employment belonged to state-owned firms. In fact, it is government that monopolise economic activities. There are several explanations for this government dominance in economic activities including the government's exclusive access to oil revenue. Article 44 of the new constitution provides exclusive rights for government in various economic activities. The 1978 revolution and the goal of social justice also greatly support government intervention in economic activities.

Although from 1989 to 1994 several attempts had been made to increase the role of the private sector and eliminate some state-owned monopolies; the share of government in economic activities did not change due to the resistance of interest groups and proponents of a large public sector; the contradictory economic policies; the tension between Iran and USA and some legislative problems related to trade law, foreign direct investment law and the labour law.

Similar to First Five Year Socio-Economic Plan of Iran, privatization, enhancing competition and efficiency, promoting the role and scope of private sector were also emphasized in the next plans. For example, chapter 4 of the Third Plan, including Provisions 28 to 35 were devoted to regulating monopolies and the competitiveness of economic activities in Iran.

An important limitation needs to be considered regarding the present analysis used to evaluate the performance of the First Five Year Economic Plan of Iran in terms of promoting competition. The concentration ratio was used as a proxy for the degree of monopoly in markets. We should, however, interpret the data on concentration with caution, because in rare cases the association of competitive behaviour and high concentration is possible.

Further work needs to be done to estimate the share of government in economic activities and concentration ratios for the period which was not covered in this paper. It is also suggested that the association between performance (price, profitability, X-efficiency), structure (barriers to entry, concentration, economies of scale) and conduct in Iranian markets be investigated in further studies. Evaluating the extent and nature of barriers to entry in markets in the Iranian economy is vital for eliminating the obstacles to increasing private sector participation.

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