

Chittle, Charles R.

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## The industrialization of Yugoslavia under the workers' self-management system: Institutional change and rapid growth

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# Kiel Working Papers

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Working Paper No. 26

THE INDUSTRIALIZATION OF YUGOSLAVIA  
UNDER THE WORKERS' SELF-MANAGEMENT SYSTEM:  
INSTITUTIONAL CHANGE AND RAPID GROWTH

by

Charles R. Chittle

AG 418 75 Weltwirtschaft  
Kiel

Institut für Weltwirtschaft an der Universität Kiel

Kiel Institute of World Economics  
Department IV  
2300 Kiel, Düsternbrooker Weg 120

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I. INTRODUCTION

A common phrase in development economics is "each less developed country is unique." A qualifier that might be added to this expression is "but some are more unique than others." Yugoslavia certainly qualified as being among the "more unique than others." The uncommon characteristics of the country are, however, more in the nature of being man-made rather than acts of God, for example, workers' self-management, decentralized socialism and frequent institutional changes - sometimes drastic - combined with rapid economic growth. Consequently the Yugoslavian industrialization experience, the willingness to experiment, the successes and setbacks, has much to contribute to the field of development economics. Yugoslavia's particular approach to industrialization and economic development is what this study is all about.

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This paper is part of a project dealing with "Import Substitution and Export Diversification in the Industrialization Process of Selected Developing Countries" being undertaken at the Kiel Institute of World Economics, with financial support provided by the "Deutsche Forschungsgemeinschaft". The paper represents the result of research undertaken in Kiel as of April 1974. It was then the author's intention to extend this paper by providing additional evidence which can only be obtained in Yugoslavia itself. However, extensive efforts to obtain the necessary approval of Yugoslav officials for such a research trip have so far proved extremely frustrating and fruitless (the correspondence that has taken place in the nine months since planning for a field trip to Yugoslavia was begun is almost equal in size to this paper). The author wishes to thank his colleagues at the Institute for their advice and encouragement.

The main concerns of this paper are certain selected aspects of Yugoslav industrialization since 1952. To provide some familiarity with industrial progress prior to 1952, the paper begins, after a brief introduction, with a short historical survey of the Yugoslav economy. This survey is divided into two parts, the first dealing with the inter-war period and the second with the period of central planning which followed the second World War and preceded the introduction of the workers' self-management system. Next follows a review of institutional and policy developments since the introduction of the workers' self-management system. This section is also divided into two parts. The first part is concerned with institutional and policy aspects of what has been termed the inaugural stage of development under the system of workers' self-management, that is, the years from 1952 to 1961; a brief description of the system is contained in this segment. The latter part deals with the more recent period, extending from 1961, which we have termed the reform stage. Following this generally descriptive material is an empirical examination of Yugoslav industrialization since 1952. This section begins with an overview of Yugoslav industrialization since 1952. Then the actual level and structure of industrial production is compared with hypothetical figures based on the past performance of other countries. Next the roles of import substitution and export expansion in the industrial growth process are examined. After this the interrelatedness of the economy is investigated. The linkages associated with the various economic sectors were computed and analyzed in the light of certain other industrialization variables. In the next sector the structure of Yugoslavia's foreign trade is assessed in terms of its capital and labor content and its directional pattern. The regional distribution of Yugoslavia's expanding national income is the subject of the next part of the paper. Following this an examination is made

of the size structure of industrial enterprises, and changes in this structure over time; efficiency implications of the size structure are noted. Some concluding remarks bring the study to a close.

## II. HISTORICAL BACKGROUND

### 1. The Inter-War Period

The state of Yugoslavia officially came into being in 1918.<sup>1</sup> It had a population of 12.1 million in 1921, which had grown to 15.6 million in 1939.<sup>2</sup> The growth in production that took place prior to World War II was slow-paced, as the data in the following table indicate. The growth of GNP at 2.6 percent per annum together

Table 1

SOME SELECTED ECONOMIC INDICES AND GROWTH RATES - PRE-WAR  
YUGOSLAVIA

1923 = 100<sup>+</sup>

	INDEX 1939	Annual Compound Growth Rate 1923-1939 (percent)
Gross National Product	150	2.6
Industry	180	3.8
Agriculture	145	2.4
Exports	85	-1.0
Imports	88	-0.8
Population	126	1.5

Sources: Rows 1-3: Anton Vratusa, "Yugoslavia, 1971", Foreign Affairs, Vol. 50, No. 1, October 1971, p. 149; Rows 4-5: Vladimir Pertot, Ekonomika Medunarodne Razmjene Jugoslavije, Knjiga II, (Zagreb: Informator, 1970), pp. 10-11; Row 6: Statistički Godišnjak, FNRJ, (Belgrade: Savezni Zavod za Statistiku, 1958), p. 75.

<sup>+</sup>1925 = 100 in the case of exports and imports.

<sup>1</sup>Prior to 1929 it was called the Kingdom of Serbs, Croats and Slovenes.

<sup>2</sup>Statistički Godišnjak SFRJ, Savezni Zavod za Statistiku, Belgrade, 1971, p. 74.

with the population growth rate of 1.5 percent imply that per capita product increased at about 1.1 percent per annum during the period. Economic policies of the government included some assistance to agriculture. A land reform program was begun in 1919; agricultural exports were promoted via trade agreements in the 1930s. Industrial policy existed in the form of state enterprise (in iron and steel, salt, tobacco, oil refining and mining, among others), one of the most protective tariff systems in Europe, and incentives for foreign investment in the economy.<sup>1</sup>

The sectoral composition of the national income between 1923 and 1938 underwent moderate change (Table 2). As to be expected after

Table 2

STRUCTURE OF NATIONAL INCOME, 1923 AND 1938  
(Percentages)

Sector	1923	1938
Industry	20.6	24.6
Agriculture	51.5	50.3
Others	27.9	25.1

Sources: 1923: George W. Hoffmann and Fred Warner Neal, Yugoslavia and the New Communism (New York: Twentieth Century Fund, 1962), p. 300; 1938: Privreda FNRJ u 1952 Godini (Belgrad: Ekonomiski Institut FNRJ, 1953), p. 170.

<sup>1</sup>This section on the economics of pre-war Yugoslavia is meant to be only a brief survey. For more on the inter-war Yugoslav economy, see Robert J. Kerner (ed.), Yugoslavia (Berkeley and Los Angeles: University of California Press, 1949); Robert F. Byrnes (ed.), Yugoslavia (New York, Praeger, 1957; and Joseph T. Bombelles, Economic Development of Communist Yugoslavia (Stanford: Hoover Foundation, 1968).



observing the data in Table 1, the share of the industrial sector in national income edged upward at a slow pace - at a rate of about one-fourth of one percent per year.<sup>1</sup> However, the share of industry in Yugoslav national income in 1938 compares favorably with that of other countries at the time. Table 3 contains data on the industrial and agricultural shares of 11 other countries.<sup>2</sup> As can be seen, the Yugoslav manufacturing and mining share exceeded the twelve-country average and was about 39 percent greater than the average of the 5 currently less developed countries in the table. The Yugoslav agricultural sector was the largest of this group of countries. The non-industrial, non-agricultural sectors taken as a group were therefore relatively underdeveloped. Since the industrial and agricultural shares did not undergo pronounced change during the inter-war period, it would appear that these sectors were relatively large upon the inception of the state.

The share of the labor force employed in agriculture and forestry was slightly higher and the share in industry slightly lower in 1938 than in 1931 (Table 4). The increase in the share of the labor force employed in these sectors would appear to indicate some lack of employment opportunities in other sectors of the economy. This is further borne out by the decrease in the employment shares of handicrafts, and commerce and tourism, in addition to industry, and the constant share of transport. The relative increase in employment in administration, social services and others, that is, in the

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<sup>1</sup>Unless specified otherwise, references to the Yugoslav industrial sector will be taken to mean manufacturing, mining and energy production.

<sup>2</sup>No claims are made as to this being a representative sample. Its composition was influenced by date availability and a desire for diversified coverage.

bureaucratic area, is obviously without great significance.<sup>1</sup> Total industrial employment approximately doubled during the period between the wars, reaching a level of about 300,000 in 1938. Meanwhile population was increasing by about 3.5 million. Assuming a labor force participation rate of this population increment of 50 percent, this means the labor force increased by about 1.75 million, of which only approximately 8 percent were absorbed by the industrial sector.

Yugoslav exports prior to World War II consisted predominately of raw materials and semi-processed goods. The leading export was timber, which accounted for about 15 percent of total exports. Major import items included iron and steel products, raw cotton and cotton yarn and products.<sup>2</sup> The structure of exports and imports in 1939 by use of product and stage of production is presented in Table 5. The foreign trade structure at this time was not untypical for a country at such a stage of development. Exports consisted primarily of industrial materials; exports of capital goods and finished manufactures were, not surprisingly, a minor share of total exports. On the other hand, over 50 percent of imports consisted of finished goods; similarly capital and consumer goods represented over one-half of imports. As can also be seen in Table 5, the structure of Yugoslavia's foreign trade was vastly transformed during the post-war period of industrialization. In addition to structural changes, the balance of trade was to move from a characteristic

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<sup>1</sup>The share of the service sector in national income was falling however (see Table 2).

<sup>2</sup>A more detailed breakdown of the inter-war foreign trade structure is contained in Joza Tomasevich, "Foreign Economic Relations, 1918-1941", in Kerner, op. cit.

TABLE 3  
GROSS DOMESTIC PRODUCT PER CAPITA AND  
SECTORAL ORIGIN OF NET DOMESTIC PRODUCT AT FACTOR COST

Country	Gross Domestic Product per Capita (1937 in 1955 \$ US)	Manufacturing & Mining <sup>b</sup> (Percentages)	Agriculture <sup>b</sup> (Percentages)
Argentina	510	17	24
Denmark	840	18	25
Germany	685	44	13
Italy	260	26	27
Japan	185	32	20
Mexico	230	22	20
Netherlands	600	24	7
Norway	790	25	14
Puerto Rico	240	12	31
Turkey	200	12	47
United States	1,330	24	9
Yugoslavia <sup>a</sup>	175	25	50
Average:			
All countries		23	24
Seven Currently MDCs		28	16
Five Currently LDCs		18	34
Note:			
a) share in national income			
b) 1938 (except for Germany, 1936 and Puerto Rico, 1939)			

Source: Sectoral origin from U.N., Statistical Yearbook 1956 (N.Y.: United Nations, 1956) pp. 473-76; GDP per capita from Maizels, Alfred, Growth and Trade, Cambridge University Press, Cambridge, 1970, Table B2.

Table 4

OCCUPATIONAL STRUCTURE OF THE EMPLOYED LABOR FORCE, 1931, 1938  
(Percentages)

	1931	1938
Agriculture & Forestry	76.3	77.8
Mining & Manufacturing	4.3	3.8
Handicrafts	6.5	4.9
Transport	1.3	1.2
Commerce & Tourism	2.8	2.4
Administration, Social Services & Others	8.8	9.9

Source: F.E. Ian Hamilton, Yugoslavia, G. Bell and Sons, Ltd., 1968, p. 118.

surplus, in every year from 1931 to 1939 the trade balance was positive, to persistent deficit.

On the eve of World War II Yugoslavia was a poor country. About three-fourths of the population was agricultural. Exports in the main consisted of primary products and industrial raw materials. The industrial sector accounted for about one-quarter of the national income. Slovenia, Vojvodina, Croatia and Serbia (mainly because of Belgrade) were at higher stages of industrialization than the other republics and autonomous areas (see Table 6). The Yugoslav per capita income of 175 United States dollars of 1955 is the lowest of the small, geographically wide-ranging sample of countries in Table 3.

## 2. Central Planning

The Yugoslav economic plant was severely damaged during World War II. Close to 40 percent of the manufacturing industry was destroyed or badly damaged.<sup>1</sup> Human loss was also great; about 11 percent of the population was killed during the war, not all of whom met death at the hands of foreigners. Twenty five percent of the population was left without shelter, 50 percent of the livestock and agricultural equipment was destroyed as well as the same share of the railways and rollingstock.<sup>2</sup>

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<sup>1</sup>Branko Horvat, "Yugoslav Economic Policy in the Post-War Period: Problems, Ideas, Institutional Developments", American Economic Review, Vol. LXI, No. 3, Part 2, June 1971, p. 71.

<sup>2</sup>Joel B. Dirlam and James L. Plummer, An Introduction to the Yugoslav Economy, Merrill Publishing Co., Columbus, Ohio, 1973, p. 15.

Table 5

STRUCTURE OF EXPORTS AND IMPORTS BY STAGE OF PRODUCTION AND USE OF PRODUCTS -  
1939, 1972

(Percentages)

	Exports		Imports	
	1939	1972	1939	1972
<b>1. Use of Products</b>				
Reproduction Goods(industrial materials)	78	51	49	63
Investment Goods (capital goods)	0	14	28	21
Consumer Goods	22	35	33	16
<b>2. Stage of Production</b>				
Crude Articles (raw materials)	55	12	20	16
Simply Transformed Articles (i.e., semi-finished goods)	39	31	26	25
More Elaborately Transformed Articles	6	57	54	59

Source: Jugoslavia 1945-1964 (Belgrad: Savezni Zavod za Statistiku, 1965), p. 207, and Statistički Godišnjak 1973, p. 219. More specific definitions of the above product categories are not provided.

Table 6

OCCUPATIONAL STRUCTURE OF THE POPULATION BY REPUBLIC AND  
AUTONOMOUS AREAS, 1939  
(Percentages)

Area	Industry	Services	Other
Slovenia	18	17	65
Croatia	10	13	76
Vojvodina	13	11	76
Serbia (excluding Belgrad)	7	6	87
Serbia (including Belgrad)	18	13	69
Kosovo-Metchija	6	4	90
Bosnia-Herzegovina	6	8	86
Macedonia	6	9	85
Montenegro	6	11	83

Source: Hamilton, op.cit., p. 132.

The coming to power of the Communist Party under Josip Broz Tito meant the end of capitalism in Yugoslavia. Most of the non-agricultural sector of the economy was nationalized in 1946. The Federal Planning Commission was established in May of that year. The economic policy of central planning, administrative socialism, or étatism, as it has variously been called, was born. It was to succumb by 1952. The Yugoslavs copied the Soviet economic system more closely than any other Eastern European nation. Economic policy was oriented towards development via industrialization. Within the industrial sector, heavy industry was the key branch; self-sufficiency in capital goods was a high priority goal.

The First Five Year Plan appeared in the spring of 1947 and covered the period of 1947-1951. In addition to the Five Year Plan, there were annual, quarterly and ten-day plans.<sup>1</sup> The plan set very high goals for the economy. National income was to increase by a factor of 1.9, agricultural output by 1.5, and industrial output by 4.9 (all compared to the levels of 1939). Foreign trade came under complete control of the state. Imports were viewed as a necessity for the fulfilment of the plan; exports were a means of disposing surplus production. Certain events occurred that helped to prevent the goals of the plan from being realized.<sup>2</sup> These included an

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<sup>1</sup>The weight of the annual plan, 3,300 pounds, provides an idea of the degree of planning.

<sup>2</sup>The index of agricultural production (1930-1939 average = 100) stood at 89 in 1947 and 75 in 1952 (Yugoslav Survey, Vol. XI, No. 4, November 1970, p. 4). The index of industrial production (1939 = 100) was at a level of 121 in 1947 and 166 in 1952 (Industrija 1971, Savezni Zavod za Statistiku, Belgrad, 1972, p. 11).



economic blockade by the Cominform countries, drought, and collectivization efforts in agriculture. Disillusionment with administrative socialism developed; the system of central planning broke down.

### III. INSTITUTIONAL AND POLICY MATTERS

#### 1. The Inaugural Stage

The end of the Soviet-type economic system in Yugoslavia had its beginnings in 1950. In that year the Law on Management of Government Business Enterprises and Economic Associations by Workers' Collectives was enacted. The passage of this law marked the beginning of the self-management system. Detailed central planning, in which individual enterprises received output quotas, was replaced by a system of planning by basic proportions. Enterprises had to follow certain rules, such as minimum capacity utilization, but they no longer had specific output quotas to meet. The federal economic plan determined certain basic proportions, such as consumption, the rate of accumulation and the distribution of investment.<sup>1</sup> The evolution since 1950 of Yugoslavia's particular brand of socialistic system has been, and remains, a virtually continuous process. The 1952-1961 period we have termed the inaugural stage of development (under the workers' self-management system).<sup>2</sup>

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<sup>1</sup> During the first part of the period industry in general and heavy industry in particular continued to be stressed, as in the previous stage. In 1956 this emphasis on the development of heavy industry softened considerably, as reflected in the structure of industrial investment (Table A-1).

<sup>2</sup> Any demarkation of Yugoslav economic development into distinct stages must of necessity be less than exact. The changes do not tend to be abrupt and well-defined. The movement from one stage to another involves writing laws, debating them in the Parliament, and making the necessary institutional changes. There thus may be a period extending to a few years during which one stage is terminating and the next is completely operational.

The adoption of the system of workers' self-management was a reaction to a feeling that administrative socialism, while freeing workers from exploitation by capitalists resulted in the substitution of state bureaucrats for capitalists as the exploiters of the workers. Now management of the firm was to be taken out of the hands of the state, operating through its official government representative, and put into the hands of the workers themselves (state ownership was replaced with "social ownership"). Management organs of the firm consist of the workers' council, the management board and the director.<sup>1</sup>

All the employees of the enterprise, termed the workers' collective, elect the workers' council by secret ballot. Council members must be members of the collective and receive no extra payment for their service on the council. The members of the council, from 15 to 120, depending on the size of the enterprise, are elected for a two-year period.<sup>2</sup> The council performs a policy-making function

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<sup>1</sup>Private activities, consisting mainly of construction, personal services, restaurants, motor transport and agriculture, are exempt from the rule of self-management. The self-management system is a major topic in itself; an admittedly brief description is presented here to provide the reader with some familiarity with the institutional nature of the system. A discussion of the theory of the worker-managed enterprise is beyond the scope of this paper (the goals of the enterprise seem to be as varied and subject to as many interpretations as those of the capitalist firm).

<sup>2</sup>Half of the members are elected annually. Enterprises are free to fix the tenure and size of the council in their by-laws. In practice the two-year term of office and size range of 15-120 members have been adopted by most enterprises. In enterprises of up to 30 employees, the workers' council consists of all the workers. In addition to business enterprises, self-management has been extended to all organizations and institutions in the field of public services, research, education, culture etc.

and meets once every 1-2 months on the average.<sup>1</sup> A managing board is elected by the council (unless the enterprise has fewer than 10 employees); this board usually consists of 5 to 11 members, including the director of the enterprise, who is an ex officio member. Recently the existence of a board of management was left to the discretion of the enterprise. The board acts like an executive arm of the council; it is responsible for establishing basic production targets, preparing financial reports and various proposals for the council, executing council decisions, and for general supervision of the director of the enterprise. In the larger enterprises self-management has been decentralized so that, in addition to the workers' council and management board of the entire enterprise, separate self-management bodies exist at, for example, the plant or process levels (work units). Decisions such as those regarding income distribution, hiring and firing, job assignments, and working conditions may be made at the work unit level of self-management. Joint decision-making among two or more work unit councils may occur. The enterprise by-laws specify those decision-making powers that are vested in the enterprise workers' council and those belonging to the work unit councils.

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<sup>1</sup> Among its duties are approving and suggesting changes in the development plans of the enterprise, electing and dismissing members of the managing board, dealing with matters of discipline and working conditions, setting wage rates for each job classification, determining the allocation of net earnings between personal incomes and reinvestment, approving participation in joint ventures and mergers, and adopting the by-laws of the enterprise.

The enterprise director is responsible for day-to-day operations of the enterprise. His functions are specified in the by-laws of each enterprise. He carries out decisions of the workers's council and the board of management and in general coordinates the operations of the enterprise. The director is appointed by the workers' council after all applicants have been considered on the basis of public competition. The term of office is four years, with re-election and early dismissal possible. In 1972, 6130 enterprises elected workers' councils consisting of 135,171 members, of whom 16.8 percent were women, 11.5 percent were young people (under 27 years of age), and 53.7 percent were production workers.<sup>1</sup>

The abandonment of administrative socialism carried with it an end to the state foreign trade monopoly. The nation made its first gesture toward free trade, which turned out to be exceedingly elusive and difficult to achieve, in 1952. The exchange rate, which previously was without economic meaning, was changed from 50 to 300 dinars per U.S. dollar. At the same time a system of export and import coefficients was introduced. These coefficients were multiplied by the official exchange rate (and later by the settlement rate) to determine the receipts and payments in dinars of exporters and importers. The export coefficients in 1952 ranged

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<sup>1</sup>Yugoslav Survey, Vol. XIV, No. 4, November 1973, pp. 14 and 23. A new enterprise may be founded by a governmental agency, an existing enterprise or group of enterprises, or by a group of private citizens. Once the initial financing and appointment of a director are carried out by the founder, the firm is turned over to the work collective for operation. When the number of paid non-family employees of a firm exceeds 5, the firm's operation must be turned over to the work collective, i.e., the firm becomes socially owned.

from 0.8 to 6 and import coefficients from 0.8 to 10. Thus the rate of exchange for different commodities ranged from 240 to 3000 dinars per U.S. dollar in 1952. Low coefficients were applied to imports of machinery and raw materials and to raw material exports. Imports of consumer goods and exports of finished products were placed in the high coefficient category. The system of multiple exchange rates remained in force, with revisions, until 1961. A summary of Yugoslav exchange rates from 1952-1972 is contained in Table 7. In 1954 a special settlement rate of exchange was introduced at 632 dinars per dollar. A free foreign exchange market was established in 1951 where exporters could sell foreign exchange that was part of their retention quota (20-45 percent in 1952). By 1956 the retention quota had been reduced to 1 percent and the free market was taken over by the National Bank. It was discontinued altogether as of 1960.

## 2. The Reform Stage

The period beginning with 1961 and extending to the present we have called the reform stage of development. It includes the major economic reforms of 1961 and 1965. These reforms came on the heels of a very successful completion of the Five Year Plan of 1957-1961. The plan was declared fulfilled after four years. On the domestic scene, the 1961 reforms were directed mainly towards the banking and financial, and the income distribution systems. The proportion of the earnings of enterprises put at their own disposal was increased.<sup>1</sup> Flat rate taxes replaced progressive

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<sup>1</sup>The proportion of the social product, that is, value added, of the enterprises at their own disposal (i.e., net personal income, enterprise funds and depreciation) was 42.8 percent in 1959 and 50 percent in 1961. (Yugoslav Survey, Vol. 11, No. 3, August 1970, p. 82).

taxes on enterprise income. The banking system was decentralized. Short-term lending was transferred from the National Bank to communal banks, republic banks were set up and political control of banking operations was relaxed. The 1961 reforms were in the main aimed at expanding the role of the market and increasing the country's international competitiveness.

Foreign-trade-system-related reforms in 1961 included a devaluation of the dinar and discontinuance of the multiple exchange rate system, which had existed since 1952. The official exchange rate had been 300 dinars per U.S. dollar. However this rate was virtually imperative once the special settlement rate of 632 dinars per dollar was introduced in late 1954. The new uniform rate became 750 dinars per dollar in 1961. The system of export and import coefficients was replaced by an import tariff and export subsidy arrangement. Export was in the main free although certain goods, consisting mainly of agricultural goods and industrial raw materials, were subject to quota or permit. Export proceeds were to be surrendered to the National Bank; part of the proceeds, for example 7 percent for most industrial exports, could be repurchased by the enterprises. About 20 percent of imports were liberalized, others were subject to permit or quota.

The first two years into the sixties were problem years for the Yugoslav economy. Inflation, relatively slow growth and an aggravating balance of payments deficit were the major sore spots. The Five Year Plan of 1961-1965 was abandoned. A vigorous debate ensued between supporters of further decentralization and reliance on the market and advocates of a shift toward more centralization.

TABLE 7  
YUGOSLAV EXCHANGE RATES, 1952 - 1972  
(Dinars per U.S.-dollar)

Year	Official Rate	Export Rate <sup>5</sup>	Import Rate <sup>6</sup>	Emigrant Rate <sup>7</sup>	Free Market Rate <sup>8</sup>	Black Market Rate <sup>9</sup>	Settlement Rate <sup>10</sup>	Tourist and Diplomat Rate <sup>11</sup>
1952	300 <sup>1</sup>	240-1800	240-3000		647	425-725		
1953		"	"		1910	450-600		
1954		316-2528	316-2528	600	379	525-710	632	
1955		316-1896	"		940	725-850		
1956		"	316-1896		5020	835-925		400
1957		316-1264	379.20-1896		6909	710-825		
1958		379.20-1264	632-1896		8217	750-815		
1959		505.60-1264	632-1580		9725	725-817		
1960		"	"			745-1000	632	400
1961				600		765-1005	750	600
1962						800-928		
1963						802-945		
1964	300					865-1059	750	
1965	1250 <sup>2</sup>					980-1570		
1966	12.50					13.50-16.00		
1967						12.75-14.50		
1968						12.65-14.10		
1969						12.50-14.15		
1970	12.50					12.95-15.00		
1971	15.00 <sup>3</sup>					15.45-17-95		
1972	17.00 <sup>4</sup>							

<sup>1</sup>As of Dec. 28, 1951 when it was changed from Din 50 per US dollar. The official rate had virtually no operational significance in the 1955-1964 period. - <sup>2</sup>As of July 26, 1965. On Jan. 1, 1966 a new dinar equal to 100 old dinars was introduced. - <sup>3</sup>This rate became effective on Jan. 22, 1971. - <sup>4</sup>Became effective on Dec. 21, 1971. - <sup>5</sup>These are the rates applicable to sales of foreign exchange by exporting enterprises. They are derived by applying various coefficients to the settlement rate of exchange (to the official rate prior to 1954). The coefficient varied with respect to commodities. Between 1952 and 1960 the coefficient ranged between 0.5 and 6 and the number of coefficients ranged from 12 to 35 at any one time. - <sup>6</sup>These are the rates applicable to purchases of foreign exchange by Yugoslav importing enterprises. They are derived in the same way as the export rates. Between 1952 and 1960 import coefficients ranged between 0.5 and 10.0. Lower coefficients were applied to foreign exchange purchased to import "essential" goods with higher coefficients for "less essentials" and luxuries. The system of export and import coefficients was replaced by an import tariff and export subsidy system in 1961. - <sup>7</sup>Applicable to receipts from emigrants' remittances and certain other non-commercial items. Discontinued after 1961. - <sup>8</sup>End of year rates. As of 1956 the free market was taken over by the National Bank where it sold exchange for a few imports and invisibles (less than 1 percent of total sales of foreign exchange). Previously exporters could sell exchange that was part of their retention quota in the free market. Terminated after 1959. - <sup>9</sup>Extremes of end of month rates on U.S. banknotes and/or unlicensed transfers to New York. - <sup>10</sup>The rate applicable to most commercial transactions (after being multiplied by the appropriate export or import coefficient) from December 1954 to July 1965 (became unified settlement rate as of Jan. 15, 1961). - <sup>11</sup>Rate for foreign tourists and diplomats in Yugoslavia. Discontinued after 1961.

Source: IMF, Annual Report on Exchange Restrictions, Washington, various issues; Pick's Currency Yearbook, Pick Publishing Corp., New York, various issues.



The views of the former prevailed. The decision to move toward greater decentralization and reliance on the market was made official when the federal parliament, in 1965, put its approval on the next reform. The reform had both short-term and long-term objectives. Short-run goals included an easing of inflation, moving the balance of payments toward equilibrium, reducing unemployment and increasing industrial capacity utilization. Longer-term objectives were concerned with increasing economic efficiency via the market. The price system was to be reformed, growth and investment policies revised, foreign trade liberalized and international competitiveness increased.<sup>1</sup>

The economic reform of 1965 was somewhat similar to that of 1961, although in 1965 there was to be<sup>a</sup> stronger drive towards decentralization and becoming more internationally competitive. Following the advance in this direction that took place as a result of the reforms of 1961, some amount of retreat occurred prior to 1965. Import restrictions increased, customs duties rose, price controls were expanded, and wage guidelines became mandatory rather than voluntary.<sup>2</sup> The dinar was again devalued (this time the meaningless

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<sup>1</sup>Rudolph Bićanić, "Economics of Socialism in Yugoslavia: The Third Stage - the Reform", in R. Bićanić, Turning Points in Economic Development, Moutton, The Hague, 1972, p. 233. Appears also in Foreign Affairs, Vol. 44, No. 4, July 1966, pp. 633-652, under the title, "Economics of Socialism in a Developed Country."

<sup>2</sup>Helen Milenkovitch, Plan and Market in Yugoslav Economic Thought, New Haven and London, Yale University Press, 1971, p. 171.

official rate of 300 dinars per dollar was abandoned) and tariffs and import controls reduced. The price system was to be restructured so as to bring prices more in line with world prices and to correct distortions in relative prices (see p. 25 and Appendix Table 2). The prices of industrial goods had been kept high in relation to raw material prices as a device to stimulate industrial production. Since the new price policy was likely to stimulate inflation, price controls were extended to 90 percent of the products.<sup>1</sup>

Additional steps were taken in 1965 to increase the share of enterprises in their product. This share, defined as the sum of net personal incomes, depreciation and enterprise funds, increased from 54 percent in 1964 to 59 percent in 1965. The 1965 reform shifted the source of investment funds to the banks and enterprises and away from the government.<sup>2</sup> Direct taxes on enterprises were eliminated and the incidence of the turnover tax was shifted from wholesale to retail enterprises.<sup>3</sup> Not all of the reforms became operational immediately, e.g., much of the reform of the foreign trade system did not become operative until 1967. In that same year export credit was expanded and made more flexible. The average tariff rate increased

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<sup>1</sup>O.E.C.D., Economic Survey of Yugoslavia, Paris, August 1966, p. 8. Price controls were subsequently relaxed. The proportion of industrial products covered by price controls was 48 percent in 1968 (Economic Survey of Yugoslavia, 1970, p. 14).

<sup>2</sup>Enterprises and banks accounted for 43.6 percent of investment funds in 1963, 63.5 percent in 1964, 73.3 percent in 1965 and 87 percent in 1966 (Statistički Godišnjak, 1967, p. 254.)

<sup>3</sup>J.T. Crawford, "Yugoslavia's New Economic Strategy: A Progress Report", in Economic Developments in Eastern Europe, U.S. Congress, Joint Economic Committee, U.S. Government Printing Office, Washington, 1970, p. 612.

from 18.8 percent in 1962 to 23.3 percent in 1964 (Table 8). The average rate has fallen somewhat since 1968 to about 11 percent. Yugoslav tariff rates in general do not appear high in comparison to rates in other less developed countries. In 1968 a 3 percent customs surcharge and a 1 percent customs clearing tax were imposed on all commodities other than those exempt from import duty. In July 1970 an additional 5 percent import surcharge was imposed on all goods which were subject to a customs duty. Restrictions on foreign exchange earnings were loosened somewhat. An import deposit scheme with an initial rate of 50 percent was put into effect in October 1970. The rate was gradually lowered and the scheme was abandoned in January 1971. The 5 percent import surcharge of 1970 was reduced to 2 percent in January 1971, increased to 6 percent in July 1971, and discontinued in December 1972. Other policy measures of July 1971 included a 6 percent subsidy on exports to convertible currency areas and Poland, a reduction in foreign exchange quotas, and special restrictions on the import of private autos and light commercial vehicles.<sup>1</sup> The dinar was devalued to 15 new dinars per dollar in January 1971 and to 17 in December.<sup>2</sup> Restrictions on the importation of certain consumer

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<sup>1</sup> Export promotion appears to have declined following the reform of 1965, which eliminated export subsidies.

<sup>2</sup> A floating exchange rate system was adopted on July 12, 1973. External convertibility of the dinar was established in January 1972 and a limited foreign exchange market opened in May 1973. In a currency reform, 100 old dinars were made equal to 1 new dinar on January 1, 1966.

TABLE 8

TARIFF RATES, 1962 - 1968

	1962	1964	1966	1968
Equipment		42.0		22.6
Industry		26.4		14.8
Overall average	18.8	23.3	10.3	13.8

Source: Yugoslav Survey, Vol. IV, No. 14, 1963, pp. 2046-2047; Vol. XI, No. 1, 1970, p. 57.

durables were tightened in December 1971.<sup>1</sup> Measures were also taken in 1971 to stimulate joint ventures, which became legal in 1967, and to restrict borrowing abroad.<sup>2</sup> The foreign exchange retention quota on January 1, 1972 was raised from 7 to 20 percent for all enterprises, except for tourist organizations (45 percent) and engineering work abroad (100 percent).

Since the creation in 1955 of the Federal Price Office, a system of administratively controlled prices has evolved. Certain goods have been subject to fixed prices, others to ceiling prices, control on the basis of advance approval, and minimum prices. Price freezes have also been applied, for example, in 1965 and 1971.<sup>3</sup> The price reforms of 1961 and 1965 were both aimed at diminishing distortions in the price system by increasing agricultural and raw material prices relative to the prices of manufactured goods. Producers' prices of industrial goods rose by 6 percent in 1961, agricultural goods by 15 percent and retail prices by 8 percent (Appendix Table 2). In 1965 industrial producers' prices increased by 15 percent, agricultural producers' prices by 43 percent and retail prices by 29 percent; the rate of inflation as shown by the implicit social product deflator was 28.4 percent. The ratio of the index of prices of manufactured goods to that of agricultural goods reveals that the terms of trade for agricultural goods have been increasing during the entire 1952-1972 period. After a period of gradual improvement, the rate of increase picked up during the first half of the 1960s, reflecting the price reforms previously noted. The improvement seems to be continuing in the 1970s.

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<sup>1</sup>OECD, Economic Survey of Yugoslavia, 1972, p. 53.

<sup>2</sup>Ibid.

<sup>3</sup>Horvat, op. cit., p. 110.

#### IV. EMPIRICAL ASPECTS OF INDUSTRIALIZATION UNDER THE SYSTEM OF WORKERS' SELF-MANAGEMENT

##### 1. An Overview

Economic growth since the New Economic System was launched in 1952 has been both rapid and unstable. The growth of industry from 1955 to 1970 of close to 10 percent annually exceeds that of the various country groups found in Table 9. The growth, of total and per capita social product also holds up well in an international comparison.<sup>1</sup> Concealed within the growth rates contained in Tables 9 and 10 is a considerable degree of instability. For example, industrial production grew at a rate of

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<sup>1</sup>The 1960-1970 rate calculated by the author from official Yugoslav data on net material product in 1966 prices is 6.5 percent. Social product (SP) differs from GNP in that "non-productive" activities are excluded from the former. Included in the non-productive, or non-economic category are health, social security, culture, education, science, economic chambers, banking, insurance, government bodies and administrative agencies, and social organizations (Yugoslav Survey, Vol. XII, No. 2, May 1971, p. 37 fn.) GNP exceeds SP by an amount that has variously been estimated to range from 10 to 25 percent. OECD estimates of Yugoslavian GNP in recent years have exceeded official Yugoslav statistics of SP by approximately 15 percent. Note that not all services are put in the non-productive category. Services connected with the production of material goods, for example, trade and transport, are included as productive activities.

16 percent in 1963 and 1964, while in 1967 there was no growth at all. The social product expressed in 1966 prices expanded by 24 percent in 1957, 2 percent in 1958, 18 percent in 1959, 4 percent in 1962, 12 percent in 1963 and 1964, and 2 percent.<sup>1</sup> The rate of inflation has also varied widely (see the Appendix). The Yugoslav experience can thus be seen to have consisted of rapid growth which was accompanied by considerable short-run price and growth instability.

The period of workers' self-management can be described as being a time during which the nation moved towards greater decentralization (politically and economically) as well as towards a more open economy. The movement throughout the period has in general been forward, although at times there have been temporary retreats. The republics, communes and enterprises have all experienced an expansion of their decision-making capacities. The industrial export share of the social product almost tripled during the 20 years to 1972 (from 4.6 to 13.2 percent at current prices and exchange rates). The industrial import share has risen also, although not as steadily as the export share. These developments, together with the approximately 15 percent greater growth rate of industrial exports than of industrial production, point towards the conclusion that Yugoslav industrial growth and institutional change have not taken place

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<sup>1</sup>Unless otherwise indicated, data in Part IV are from Statistički Godišnjak, SFRJ.

Table 9

AVERAGE ANNUAL COMPOUND GROWTH RATES OF REAL GROSS DOMESTIC  
PRODUCTION AND INDUSTRIAL PRODUCTION

	Real Gross Domestic Product				Industrial Production
	Total		Per Capita		
	1950-1960	1960-1970	1950-1960	1960-1970	1955-1970
Developed Market Economy Countries	4.1	4.9	2.8	3.7	5.1
Developing Countries	4.7	5.2	2.4	2.5	7.6
Socialist Countries <sup>1</sup>	9.3	6.6	7.8	5.4	9.2
Yugoslavia <sup>2</sup>	7.1 <sup>3</sup>	5.9	6.0 <sup>3</sup>	4.7	9.9 <sup>4</sup>

<sup>1</sup> Excluding non-material services

<sup>2</sup> Net material product

<sup>3</sup> 1952-1960

<sup>4</sup> Calculated by the author from data in Statisticki Godisnjak SFRY 1972.

Source: U.N. Handbook of International Trade and Development Statistics, 1972, New York, 1972, Tables 6.2 and 6.7.



TABLE 10  
SELECTED ECONOMIC INDICATORS

1. Average Annual Compound Growth Rates

	1952-1956	1956-1961	1961-1965	1965-1970	1952-1970	1952-1972
Population	1.3	1.0	1.1	0.9	1.1	1.1
Social Product <sup>1</sup>	7.0	10.6	7.3	6.3	7.9	7.7
Social Product per Capita <sup>1</sup>	5.7	9.4	6.2	5.3	6.7	6.6
Industrial Value Added <sup>1</sup>	12.8	12.5	12.3	6.8	10.9	10.7
Total Exports <sup>1</sup>	9.6	11.4	12.2	5.9	9.6	9.7
Industrial Exports <sup>1,2</sup>	12.2	13.9	17.0	6.9	12.2	12.0
Total Imports <sup>1</sup>	7.1	13.4	4.7	14.4	10.3	9.3
Industrial Imports <sup>1</sup>	1.5	19.2	4.1	16.3	10.1	9.1

2. Other Indicators

	1952	1956	1961	1965	1970	1972
Export Share of Social Product (percent) <sup>3</sup>	7.8	6.0	12.7	17.2	16.0	15.5
Import Share of Social Product (percent) <sup>3</sup>	11.8	8.8	20.3	20.2	27.4	22.5
Index of Industrial Production	100	162	294	455	611	727
Index of Industrial Exports <sup>1</sup>	100	159	304	569	785	971
Share of Industrial Exports in Total Exports <sup>1</sup>	56.0	61.4	68.7	81.2	84.9	85.0
Real per Capita Social Product (in U.S. dollars at the exchange rate of 15 ND = \$ 1 and in 1966 prices)	126	157	246	313	405	451
Industrial Export Share of Industrial Production (percent)	4.6	4.2	9.3	16.1	15.7	13.9

<sup>1</sup> In 1966 prices.

<sup>2</sup> Broad definition of industrial exports, e.g., includes food manufactures and beverages, used throughout this table. Exports of SITC 5-8 rose from 37.9 percent of total exports in 1953 to 70.5 percent in 1970.

<sup>3</sup> In current prices. Exchange conversion rates used: 1952 and 1956: 300 (old) dinars = \$ 1 U.S.; 1961: 750 (old) dinars = \$ 1; 1965: 12.5 (new) dinars = \$ 1; 1970: 15 (new) dinars = \$ 1; 1972: 17 (new) dinars = \$ 1.

Sources: Computed from data in Savezni Zavod Za Statistiku  
Statistički Godišnjak, SFRJ; Statistika Spoljne Trgovine SFRJ; Industrijska Preduzeća;  
Industrija.

behind closed doors.<sup>1</sup>

The more rapid growth of industrial value added than of the social product implies an increase in the share of the industrial sector in the social product. This is of course what has actually happened, as Table 11 reveals. A contributor to the rapid economic growth was a high investment rate. The share of gross fixed capital formation

Table 11

SECTORAL STRUCTURE OF THE SOCIAL PRODUCT (1966 prices)  
(in percent)

Sector	1952	1956	1961	1965	1970	1972
Industry	22.0	27.3	29.7	35.6	36.5	38.1
Agriculture	33.3	32.2	28.4	22.7	20.1	18.9
Forestry	3.9	2.8	1.8	1.6	1.2	1.0
Construction	10.6	7.2	9.2	8.9	9.6	8.8
Transport and Communication	6.5	7.1	7.5	7.4	7.8	7.6
Trade and Catering	16.5	16.0	17.2	18.1	19.5	20.2
Arts and Crafts (productive part)	7.1	7.4	5.7	5.3	4.9	5.0

Source: Statistički Godišnjak SFRJ.

<sup>1</sup>There are of course other indicators of the openness of the country besides the foreign trade ones cited here.

in the social product (1966 prices) averaged 31 percent in 1952-1970.<sup>1</sup> Structural changes in the foreign trade sector are highlighted by the increase in the share of industrial exports (broad definition) in total exports (from 56 to 85 percent).

We have attempted in this section to provide a skeletal review of the industrialization of Yugoslavia since the system of workers' self-management became a reality. The growth performance has been impressive. Yet economic problems of major proportions exist

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<sup>1</sup> Incremental capital-output ratios (ICOR) for various periods were as follows (investment and output in 1966 prices):

SECTOR	1953-1959	1960-1964	1965-1969
Social Sector	2.43	2.69	2.91
Industry	2.83	2.76	3.37
Construction	1.17	0.72	0.62
Transport and Communication	4.17	7.58	4.82
Trade and Catering	0.56	0.90	1.30

Source: Investicije, 1947-1969, Institut za Ekonomiku Investicija (Institute for Economic Investment), Belgrade, 1971; Statistički Godišnjak SFRJ.

The increase in the ICOR for industry likely reflects an increasing share of industrial investment going to the relatively capital-intensive industries. Eight of the most capital-intensive industries (electrical power, paper, coal, wood, ferrous metals, non-ferrous metals, petroleum and non-metals) accounted for 56 percent of industrial investment in 1961-1965 and 63 percent in 1965-1970. There are of course other factors that may have contributed to the change in the ICOR. An analysis of these factors lies outside the scope of this paper.

Among these problems are inflation (the inflation rate was 19 percent in 1971 and 15 percent in 1972), slackening of the growth rate, regional income disparities (per capita social product in the autonomous province of Kosvovo was about one-fifth that of Slovenia in 1970), and balance of payments disequilibrium (the current account balance in millions of U.S. dollars in 1970, 1971 and 1972 was -340, -324, and 294 respectively; exports as a percentage of imports in the same years were 58.4, 55.8 and 69.1 percent).

## 2. The Level and Structure of Industrial Production - Actual versus Estimated Hypothetical

Yugoslavia's experience with central planning of the Soviet-type contributes to an intuitive feeling that the industrial sector of the economy has grown faster, in relation to the rest of the economy, than "average". In this section this hypothesis will be empirically examined. To do this the actual share of industry in the economy's output will be compared with an estimated hypothetical share derived from a cross-sectional (over 40 countries) regression equation in which GNP was regressed on population and per capita income.<sup>1</sup> The actual and hypothetical shares have been

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<sup>1</sup>The hypothetical shares were computed from equations contained in a cross-section regression model in G. Fels, K.W. Schatz and F. Wolter, "Der Zusammenhang zwischen Produktionsstruktur und Entwicklungsniveau, Versuch einer Strukturprognose für die westdeutsche Wirtschaft", Weltwirtschaftliches Archiv, Bd., CVI, 1971, I, pp. 240-278. Yugoslav social product was increased by 15 percent in an attempt to frame the analysis on a GNP basis. The Yugoslav definition of industry encompasses manufacturing, mining and power. To put the shares on a comparable basis, the normal share includes manufacturing and mining.

calculated for three post-war years. It can be seen that the economy was "over-oriented" towards industry (in relation to the countries included in the study cited below). The ratio of the actual to hypothetical share however has declined in the later years, indicating that the growth of the Yugoslav industrial sector relative to the growth

	1952	1961	1970
	(percentages)		
Actual	19.1	25.8	31.7
Estimated Hypothetical	13.2	19.0	24.3

of other economic sectors has been slower than expected based on the experience of other countries. An explanation of this tendency may be that the relatively high actual share in 1952 reflects the imitative strategy of the central planning period, while in more recent years the influence of this legacy has declined. Nevertheless, the actual share in 1970 exceeded the hypothetical by 30 percent. The data point toward the conclusion that the industrial sector in the post-war period in Yugoslavia has been larger than would be expected from the experiences of other countries; the trend since decentralization began has been toward a gradual reduction of the ratio of the actual to the hypothetical share, while the industrial share of total output remains considerably larger than one would expect based on the past performance of other countries.

*influence  
of the price*

In order to determine the relative effect of Yugoslavia's industrialization policies, the hypothetical structure of the industrial sector itself has also been calculated and compared with the actual structure (see the article cited in the previous footnote for the regression equations used and the list of over 70 countries used in their estimation). The structure was estimated using value added data for 1952, 1961 and 1970 (Table 12). In 1952 the actual share exceeded the hypothetical in 8, in 1961 in 9 and in 1970 in 10 of the 15 industrial branches. Metals, machinery, and transport equipment accounted for the increase in 1961, while the additional branch in 1970 was the chemical industry. The industry branches in which the actual share is less than the hypothetical are in the main consumer industries. This may also be a reflection of Yugoslavia's earlier Soviet-type economy.

### 3. The "Sources" of Industrial Growth

Industrial production in 1970 exceeded the 1952 level by a factor greater than six. For three industrial branches, petroleum, chemicals and electrical machinery and supplies, the growth factor exceeded ten (Table A-3). It would be useful to know what provided the stimulus for this growth, e.g., import substitution, export expansion or domestic demand. The purpose of this section is to separate the "source" of industrial growth into these three categories. This exercise will provide information for analyzing the Yugoslav industrialization strategy with respect to its being

"inward" or "outward" oriented.<sup>1</sup>

H. Chenery developed an identity from which the "sources" of growth can be derived. This identity is

$$\Delta X_i = \frac{X_i^1}{Z_i^1} \cdot \Delta D_i + \frac{X_i^1}{Z_i^1} \cdot \Delta E_i + \left( \frac{X_i^2}{Z_i^2} - \frac{X_i^1}{Z_i^1} \right) Z_i^2$$

where

- $X_i$  = gross output of industry  $i$
- $M_i$  = imports of  $i$
- $Z_i = X_i + M_i$  = total available supply
- $D_i$  = domestic intermediate and final demand
- $E_i$  = exports of  $i$
- 1,2 = time periods

Now, by dividing the above equation by  $\Delta X_i$ , the "sources" of industrial growth can be estimated; the first term on the right of the equality sign is the growth attributable to domestic demand expansion, the second term is growth arising from export expansion, and the last term represents import substitution (IS).

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<sup>1</sup>The methodology used here to identify the sources of growth owes its origin to the work of Hollis B. Chenery, ("Patterns of Industrial Growth", American Economic Review, Vol. 50, No. 34 (September 1960), pp. 324-354), and the modifications of Samuel A. Morley and Gordon W. Smith, ("On the Measurement of Import Substitution," American Economic Review, Vol. 60, No. 4 (September 1970), pp. 728-735), and William Tyler, ("Methodological Notes on Analyzing the Manufactured Performance in Less Developed Countries," Kiel Discussion Papers, No. 28, Kiel Institute of World Economics, February 1973).

Table 12

ACTUAL AND HYPOTHETICAL NORMAL STRUCTURE OF YUGOSLAV INDUSTRIAL VALUE ADDED  
(Percentages)

Industry Branch	Actual	Hypo-	Act./		Actual	Hypo-	Ratio		Actual	Hypo-	Ratio
	1952	thetical	Hyp.		1961	thetical	1961		1970	thetical	1970
		1952	1952			1961	1961			1970	1970
Food Industries	8.5	14.2	0.6		9.9	16.2	0.6		9.5	15.5	0.6
Tobacco	4.5	2.0	2.3		2.3	2.0	1.2		1.5	1.4	1.1
Textiles and Clothing	16.2	29.2	0.6		12.8	24.5	0.5		11.3	25.1	0.5
Wood, etc.	10.6	4.0	2.7		6.5	3.9	1.7		5.6	3.5	1.6
Paper	1.2	3.1	0.4		1.4	2.9	0.5		2.0	2.7	0.7
Printing, etc.	3.5	2.0	1.8		4.2	2.9	1.4		3.9	3.2	1.2
Leather	3.1	1.0	3.1		2.5	0.9	2.8		2.0	0.7	2.9
Rubber	0.9	2.4	0.4		1.0	2.0	0.5		1.2	1.6	0.8
Chemicals	2.7	8.2	0.3		5.1	9.6	0.5		10.4	9.5	1.1
Petroleum and Coal	11.4	0.8	14.3		8.5	1.5	5.7		6.5	1.6	4.1
Non-Metallic Minerals	8.3	7.5	1.1		7.4	6.5	1.1		7.6	6.2	1.2
Non-Ferrous & Ferrous Metallurgy	11.5	6.2	1.9		10.5	6.0	1.8		8.7	6.2	1.4
Metals, Machinery and Transport Equipment	15.5	15.9	1.0		22.1	15.8	1.4		22.6	16.4	1.4
Electrical Machinery	2.0	1.3	1.5		4.9	2.5	2.0		6.5	3.4	1.9
Other	0.2	2.1	0.1		0.1	2.9	0.1		0.5	3.1	0.2

Source: Actual values computed from data in Statistički Godišnjak SFRY and Industrijska Predužeca.  
Normal values computed from equations in G. Fels, K.N. Schatz and F. Wolter, Der Zusammenhang zwischen Produktionsstruktur und Entwicklungsniveau, versuch einer Strukturprognose für die westdeutsche Wirtschaft, Weltwirtschaftliches Archiv, Bd. CVI, 1971 I, pp. 249 sqq.



This measure of import substitution is likely to underestimate actual import substitution because of intermediate effects not taken into account. This downward bias would be especially likely for a country like Yugoslavia, whose industrial sector has a relatively high degree of interdependence. To avoid this bias the measure of import substitution can be redefined as follows:

$$IS_i^x = \left( \begin{array}{cc} X_i^2 & X_i^1 \\ \frac{X_i^2}{Z_i^2}x & - \frac{X_i^1}{Z_i^1}x \end{array} \right) Z_i^2x = \left( \begin{array}{cc} M_i^1x & M_i^2x \\ \frac{M_i^1x}{Z_i^1} & - \frac{M_i^2x}{Z_i^2} \end{array} \right) Z_i^2x$$

where

$$M_i^x = \sum_j c_{ij} M_j$$

$$Z_i^x = X_i + M_i^x$$

with the  $c_{ij}$ 's being elements of the Leontief inverse matrix,  $(I-A)^{-1}$ . Or in matrix notation:

$$M^x = (I-A)^{-1} M,$$

a vector of redefined imports. The interpretation of  $M^x$  is that it is a measure of the domestic production required to completely substitute for imports, assuming final demands remain constant.

Similarly, intermediate effects can be taken into account in measuring the contribution of exports to economic growth. Using the same notation as above, the measure of export contribution (EE) is,

$$EE_i^x = \frac{X_i^1}{Z_i^1} (E_i^{2x} - E_i^{1x})$$

and the vector of redefined exports becomes

$$E^x = (I-A)^{-1} E$$

which is a measure of the total production attributed to exports. Using the concepts of redefined exports and imports, we formulate the following identity:

$$\Delta X_i = \frac{X_i^1}{Z_i^1} \Delta D_i + \frac{X_i^1}{Z_i^1} \Delta E_i^x + \left( \frac{M_i^{1x}}{Z_i^1} - \frac{M_i^{2x}}{Z_i^2} \right) Z_i^{2x}$$

Again, the proportion of growth attributable to each of the three "sources" can be obtained by dividing through by  $\Delta X_i^1$ .

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<sup>1</sup>The term for domestic demand can be considered as a residual and is found by subtracting the sum of  $IS^x$  and  $EE^x$  from 100 (percent). Note also that the proportion of growth attributed to import substitution and export expansion is underestimated because the method of calculation does not take account of secondary income effects (see Tyler, op. cit.). One should also bear in mind that  $IS^x$  is an ex post concept. It is a definitional measure of import substitution and as such does not necessarily convey implications with respect to an economic policy of import substitution. That is, import substitution as measured here may occur without an orientation of policy in that direction. Additionally, the base years in the measurement have a crucial importance. For example, one would expect, ceteris paribus, that  $IS^x$  would be less if the end-period (beginning-period) year is one of economic buoyancy (slump), and the more rapid the expansion and the closer to full employment the economy is, the less will be  $IS^x$ .

The sources of growth were calculated using both constant and current prices. Because Yugoslav prices have been subject to considerable government control and change by decree the use of constant prices is preferred.<sup>1</sup> However it was not possible to obtain data in constant prices for the 20 branches of the Yugoslav industrial sector. The analysis in this section is limited to the 11 branches for which it was possible to calculate exports in constant prices (Table 13). To obtain export and import values in constant prices of 1966, current dinar values were arrived at by using the 1966 exchange rate of 12.5 new dinars = \$ 1 (U.S.) and were then deflated by the export or import price index (1966 = 100) for the appropriate branch of industry. Production by industry branch in 1966 prices was calculated by using the 1966 input-output table and indices of production. Constant-price calculations of the sources of growth for various periods are shown in Table 13.<sup>2</sup> The sources of growth computed from current price data have been included in the appendix. Because these results are generally in line with the analysis in this section based on constant prices it was not felt necessary to analyze them here.

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<sup>1</sup>Constant price data are however not to be considered as being free of imperfections either.

<sup>2</sup>The eleven industry branches for which we have data in constant prices accounted for about three-fourths of the value added in 1966 of the industrial sector less electric power and coal and coke.

Looking at the results in Table 13 on a four-period basis (1952-1956, 1956-1961, 1961-1965, 1965-1970) first, import substitution appears to have been an important source of industrial growth in the first and third periods, while being negative in the second and last periods.<sup>1</sup> The increase in the role of import substitution in period three may be a result of the introduction of a tariff system as part of the economic reforms of 1961. The average tariff rate rose by about 24 percent between 1962 and 1964 (from 18.8 % to 23.3 %) and was accompanied by increasing import restrictions. The last period includes the reform of 1965, which was to push open the doors of the economy considerably wider. And the data support the conclusion that progress was indeed made. No doubt helped along by a reduction in the average tariff rate on industrial goods from 26.4 percent in 1964 to 15 percent in 1969 (13.1 % in 1971), import substitution became significantly negative.<sup>2</sup> Meanwhile the role of export

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<sup>1</sup> A negative value for import substitution implies that imports (direct plus indirect) have grown faster than total supply (imports plus domestic production), i.e., the ratio of imports to total supply was greater at the end of the period than at the beginning. The results for period three provide indication that import substitution and export expansion are not necessarily conflicting sources of growth.

<sup>2</sup> The strange values in Table 13 for the coal industry seem to be connected with a decline in real output from 1965 to 1970. While export expansion in value terms was positive, the negative output expansion produced a negative value for the share of export expansion in output growth.

Table 13

## SOURCES OF INDUSTRIAL GROWTH (constant price data)

Percentages

	1952-56			1956-61			1961-65			1965-70			1952-61			1961-70		
	IS	EE	DD	IS	EE	DD	IS	EE	DD	IS	EE	DD	IS	EE	DD	IS	EE	DD
Coal & Coke	9.1	8.0	83.9	-37.2	19.0	118.2	-8.1	35.4	72.7	273.0	-82.2	-90.8	-1.1	13.0	88.1	-430.5	211.7	318.8
Crude Petroleum	37.9	7.8	54.3	36.9	9.6	53.5	-1.5	18.6	82.9	-47.3	5.2	142.1	16.7	7.8	75.2	-31.1	10.1	121.0
Ferrous Metallurgy	71.9	15.0	13.1	-67.5	19.7	147.8	21.6	39.5	38.9	-44.6	21.2	123.4	0.3	13.1	86.6	-19.3	26.4	92.9
Non-Ferrous Metallurgy	37.2	-13.1	75.9	-55.6	41.1	114.5	18.5	62.8	18.7	-137.9	103.8	134.1	-0.3	19.0	81.3	-62.4	83.0	79.4
Non-Metallic Minerals	66.6	19.6	13.8	-19.6	19.2	100.4	16.8	36.5	46.7	-55.8	16.1	139.7	13.7	15.5	47.5	-17.0	24.8	92.2
Metal Products	76.6	5.8	17.6	-33.4	18.5	114.9	56.1	20.7	23.2	-94.6	11.4	183.2	0.1	10.4	89.5	8.2	15.7	76.1
Electrical Machinery & Supplies	88.7	8.7	2.6	15.5	17.2	67.3	42.3	15.3	42.4	-24.5	18.8	105.7	3.5	9.1	87.4	21.4	15.1	63.5
Chemicals	34.7	9.6	55.7	16.0	11.1	72.9	25.1	21.7	53.2	-10.1	9.0	101.1	1.1	9.1	89.8	11.8	12.8	75.4
Paper & Paper Products	43.4	13.2	55.0	-23.5	16.1	107.4	22.1	20.8	57.1	-69.1	20.1	149.0	6.3	12.8	80.9	-11.9	19.4	92.5
Textiles	6.3	20.2	73.5	-11.0	13.8	97.2	5.4	21.2	73.4	-38.3	41.6	96.7	0.0	15.9	84.1	-9.1	28.1	81.0
Food Industries	7.0	1.8	91.2	-0.2	19.8	80.4	5.5	5.5	89.0	-11.0	4.1	106.9	0.1	13.8	86.1	-2.0	4.7	97.3
TOTAL <sup>1</sup>	36.7	7.8	55.5	-24.8	19.8	105.0	23.0	25.3	51.7	-42.4	21.2	121.2	0.7	13.7	85.7	-28.7	33.3	95.4

<sup>1</sup> Weighted average (gross output weights).Source: Yugoslav Input-Output Table, 1966; Statistički Godišnjak SFRJ; Statistika Spoljne Trgovine. See text for method of computation.

expansion in the growth process fell somewhat as export promotion activities were reduced, but still remained at a substantial 21.2 percent.

Dividing the 1952-1970 period into two sub-periods coinciding with the previously defined inaugural and reform stages yields a picture that implies Yugoslavia made substantial progress in opening the economy.<sup>1</sup> Viewed from this light, import substitution has occupied a minor role in the growth of industry. And the period of reform has seen a mounting importance of export expansion. The import substitution that occurred in 1961-1970 was confined to non-consumer goods industries.<sup>2</sup> Metal products and electrical machinery were the two highest tariff-protected industries in the industrial sector in 1969, the rates being 25.1 and 21.7 percent respectively; no other industry was protected by a tariff greater than 13.1 percent.

#### 4. Linkages in the Yugoslav Economy

An important characteristic of an industry is the interdependence between it and other industries. The capacity of an industry to stimulate production increases in supplier and user industries should receive consideration (but should not result in the factor pro-

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<sup>1</sup>The current price data yield results that imply considerably less, although still positive, progress was made in this direction.

<sup>2</sup>Does not hold true in the case of current price data.

portions of the production process being ignored) in the formation of development policy. The greater the backward and forward linkages of a sector, the greater ceteris paribus, will be its contribution to the growth process. In an effort to shed further light on the industrialization process in Yugoslavia, we have computed the forward and backward linkages for 29 economic sectors.

Estimates of the linkages were made using the Leontief inverse matrix,  $[I-A^{(D)}]^{-1}$ , calculated from the 1962 input-output table. Each of the elements  $c_{ij}$  in the matrix indicates the gross output of sector  $i$  required to produce one unit of sector  $j$ . Each column sum,  $\sum_i c_{ij}$ , represents the gross output from all sectors necessary to produce one unit of product  $j$ . Similarly, each row sum,  $\sum_j c_{ij}$ , denotes the output of sector  $i$  needed for the production of one unit of each of the  $j$  sectors. A measure of the backward linkages of sector  $i$  is its column sum and the forward linkages are indicated by its row sum. Following Rasmussen, one can then compute an index of forward and backward linkages.<sup>1</sup> The index relates the linkages of a given sector to what is essentially a national average. The computation of the index takes the following form:

$$B_j = \frac{\frac{1}{n} \sum_{i=1}^n c_{ij}}{\frac{1}{n^2} \sum_{j=1}^n \sum_{i=1}^n c_{ij}}$$

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<sup>1</sup> P.N. Rasmussen, Studies in Inter-Sectoral Relations (Amsterdam: North Holland Publishing Co., 1956), pp. 133-135. Note also that, as implied by the  $[I-A^{(D)}]^{-1}$  matrix, the output figures associated with the  $c_{ij}$  elements are domestic requirements.

$$F_i = \frac{\frac{1}{n} \sum_{j=1}^n c_{ij}}{\frac{1}{n^2} \sum_{i=1}^n \sum_{j=1}^n c_{ij}}$$

where n refers to the number of sectors in the input-output table. The greater the value of  $B_j$  and  $F_i$  the greater the stimulus to output in other sectors emanating from a given sector. The indexes together with a sectoral ranking are presented in Table 14.

Spearman rank correlation tests were performed in order to determine if there is an association between the linkage characteristics of industries and certain industrialization variables. The results of these tests, which are contained in Table 15, show the association to be extremely weak. The correlation coefficient between the share of industrial investment (1952-1961) and forward and total linkages is significant at the .01 level, indicating that government policy (the investment decision was a Federal one during this period) had the effect of channelling higher shares of industrial investment towards those industries with the greatest forward and total linkages. In this way output and employment in industries involved in production at a "higher" stage were stimulated. The rank correlation between export expansion as a source of growth (computed from current price data) and total linkages is significant at the .10 level; all of the other correlation coefficients were found to be not significant at this level of significance. In addition to the coefficients being not significant, several have the "wrong" sign, for example, the association between import substitution measured in constant prices and linkages turned out to be not only weak but negative. It would appear that Yugoslav industrialization policy, from an ex post standpoint at least, and based upon the data in Table 15, did not attach great importance to the linkage characteristics of the various industrial branches.



Table 14

BACKWARD AND FORWARD LINKAGES IN YUGOSLAVIA, 1962

	Index B <sub>j</sub>	Rank		Index F <sub>i</sub>	Rank	
		Total	Industry Only		Total	Industry Only
Electricity	.90	20.5	17	1.01	13.5	10
Coal-Production & Processing	.86	24.5	19.5	1.20	8	6
Crude Petrol	.86	24.5	19.5	1.04	10.5	8
Ferrous Metal	1.56	1	1	1.82	1	1
Non-Ferrous Metal	1.32	2	2	1.58	3	2
Non-Metals	.94	19	16	.85	17	12
Metal Products	1.16	5.5	5.5	1.54	4	3
Shipbuilding	1.04	11	10	.61	27.5	20
Electrical Machinery	1.16	5.5	5.5	.94	15	11
Chemicals	.99	14.5	12.5	1.21	7	5
Building Materials	.97	17.5	14.5	.77	20	14
Wood Manufacturing	1.11	9	8	1.03	12	9
Paper	1.13	8	7	1.31	6	4
Textiles	1.06	10	9	1.18	9	7
Leather & Footwear	1.20	3	3	.83	18.5	13
Rubber Products	.80	26	21	.67	23	16
Food Manufacturing	1.18	4	4	.66	24.5	17.5
Printing & Publishing	.97	17.5	14.5	.65	26	19
Tobacco Manufactures	.89	22	18	.66	24.5	17.5
Motion Picture Production	.99	14.5	12.5	.73	21	15
Miscellaneous Manufacturing	1.03	12	11	.58	29	21
Agriculture	1.01	13		1.69	2	
Forestry	.69	28		1.01	13.5	
Construction	1.14	7		.91	16	
Transport & Communication	.90	20.5		1.35	5	
Trade & Catering	.70	27		1.04	10.5	
Service Rendering Arts & Crafts	.98	16		.83	18.5	
Public Utilities	.87	23		.61	27.5	
Scrap & Wastes	.57	29		.70	22	

Source: computed from data in the Yugoslav Input-Output Table, 1962.

Table 15

SPEARMAN RANK CORRELATION COEFFICIENTS BETWEEN  
LINKAGES AND SELECTED GROWTH VARIABLES

	Backward Linkages (B <sub>j</sub> )	Forward Linkages (F <sub>i</sub> )	Total Linkages (B <sub>j</sub> + F <sub>i</sub> )
Annual Average Output Growth <sup>1</sup> (1952-1961)	.112	.122	.125
$\frac{IS^*}{\Delta X}$ (1952-1961) <sup>2</sup>	-.241 (-.011)	-.314 (.158)	-.214 (.003)
$\frac{EE^*}{\Delta X}$ (1952-1961) <sup>2</sup>	.364 (.213)	.075 (.184)	.261 (.299) <sup>5</sup>
Annual Average Export Growth <sup>1</sup> (1952-1961)	.246	-.295	-.273
Share of Industrial Investment <sup>3</sup> (1952-1961)	.268	.550 <sup>4</sup>	.552 <sup>4</sup>
<sup>1</sup> 17 sectors <sup>2</sup> 11 sectors, numbers in parentheses are results when current price data were used to compute the sources of growth (20 sectors, see Table A-4) <sup>3</sup> 21 sectors <sup>4</sup> significant at .01 level <sup>5</sup> significant at .10 level; all others not significant at this level			

Source: Computed from data in Tables 13 and 14 and in Statistički Godišnjak SFRJ and Statistika Spoljne Trgovine.

## 5. Factor Intensities of Yugoslav Foreign Trade

Yugoslav exports totalled \$ 2237 million in 1972, while imports came to \$ 3233 million. The foreign trade turnover (exports plus imports) was equal to 40 percent of the social product (about 33 percent of the GDP at market prices). Exports and imports were equal to about \$ 107 and \$ 156 per capita respectively. Foreign trade is thus seen to be an important part of the Yugoslav economy. Exports per capita and the export-GDP, import-GDP and foreign trade turnover-GDP ratios for 1969 were calculated for Yugoslavia and nine other countries that are similar to Yugoslavia in area or per capita GDP (Table 16). In comparison with this small sample of countries, the Yugoslav ratios and exports per capita are relatively high. This is another indication of the important role that foreign trade plays in the Yugoslav economy.

In this section an attempt will be made to provide some information on the efficiency of Yugoslav foreign trade, that is, the extent to which the foreign trade structure reflects the country's comparative advantages. This will be done by examining the factor content of exports and imports. The familiar Heckscher-Ohlin model with its usual assumptions is used. Additionally, the assumption is made that capital is Yugoslavia's relatively scarce factor of production and labor the relatively abundant one.<sup>1</sup> The number of Yugoslav emigrant workers, about 900,000 (about one-fifth of the total paid domestic employment) lends some support to the proposition

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<sup>1</sup> However interest rates in Yugoslavia have been kept artificially low.

that Yugoslavia is a relatively labor-abundant country.

Output, export and import data for 1968 were taken from the 29-sector input-output table for 1963. Fixed assets and employment of the various sectors for 1968 were obtained from the Statistical Yearbook (Statistički Godišnjak) for 1970 and from Yugoslav Survey of May 1970. From these data the direct capital- and labor-output ratios were calculated. Each of these two vectors (of capital- and labor-output ratios) was then multiplied by the inverse matrix  $(I-A)^{-1}$  described previously to produce the total (direct plus indirect) capital- and labor-output ratios for the various sectors of the economy. The next step was to multiply these ratios by the exports of each respective sector to determine the total capital and labor embodied in Yugoslav exports of each sector (Table A-5). By summing these factor requirements for the various industrial sectors one arrives at the total factor requirements for Yugoslav industrial exports. Repeating the last two steps with respect to imports produces the total capital and labor required to produce domestically Yugoslavia's industrial imports.<sup>1</sup>

The ratios of capital to labor embodied in various groups of exports and imports are presented in Table 17. Looking at the bottom two rows of the table we find that the relative capital-intensity of total exports exceeds that of total imports. For a relatively capital-scarce country this is not what one would expect. However included in total trade are non-competitive imports, i.e., imports of goods whose domestic elasticity of supply is extremely low, e.g.,

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<sup>1</sup>An implicit assumption here is that all the industrial branches in the input-output table are import-competing.

TABLE 16  
INTERNATIONAL COMPARISON OF FOREIGN TRADE RATIOS, 1969

	(1)	(2)	(3)	(4)	(5)	(6)
Country	Area	Per-Capita GDP <sup>1</sup>	Export-GDP Ratio	Import-GDP Ratio	Foreign Trade Turnover-GDP Ratio (col.3+col.4)	Exports per capita
	(1000 Km <sup>2</sup> )	(U.S.-\$)	(percent)	(percent)	(percent)	(U.S.-\$)
Yugoslavia	256	601	12.1	17.5	29.6	73
Rumania	237	800 <sup>2</sup>	10.2	10.9	21.1	82
France	547	2804	10.5	12.2	22.7	296
Greece	132	955	6.6	18.9	25.5	63
Spain	505	867	6.6	14.6	21.2	58
Japan	370	1642	9.5	9.0	18.5	156
Philippines	300	314	8.3	10.7	19.0	26
Thailand	514	181	11.3	20.5	31.8	20
Syria	185	259	13.2	23.4	36.6	35
Paraguay	407	240	9.2	12.6	21.8	22

<sup>1</sup>At market prices. - <sup>2</sup>Tentative estimate of GDP in 1967 prices.

Source: U.N. Demographic Yearbook 1969, Table 2; U.N. Yearbook of National Accounts Statistics, 1973; Vol. III, Table I-A; U.N. Handbook of International Trade and Development Statistics, 1972, Table 1.1 and 6.1; OECD, Economic Survey of Yugoslavia, 1973, Tables B and J.

coffee, tea and cocoa, and commodities whose production location is tied to an input source, i.e., supply-oriented industries such as mineral production. For our purposes it is more meaningful to look at certain sub-categories of exports and imports. The first two rows of Table 17 relate to trade in sectors 4-21 of Table A-5, i.e. industrial sector (Yugoslav definition) goods minus electrical energy, coal and crude petroleum production and processing. Here we find the "right" relationship between the export and import capital-labor ratios; the capital intensity of imports is 9.6 percent greater than of exports.

In addition, the factor requirements of two other export and import groups have been calculated. First, industrial sector exports and imports were reduced by attempting to exclude goods for which the nation's natural endowment is a major determinant of comparative advantage as opposed to capital and labor, i.e., domestic (non-capital and -labor) resource-related industries. After this process of elimination the remaining industries consist of ferrous metallurgy, metal products, shipbuilding, electrical machinery, chemicals, textiles, and leather and footwear. This time the capital intensity of imports is greater than of exports by a very substantial 28.4 percent. The most exclusive group of commodities includes six newly-created industries (petroleum, ferrous metallurgy, metal products, shipbuilding, electrical machinery and chemicals). These industries were established mainly during the period of the first post-war plan and were favored by the export coefficient and subsidy system that existed from 1952 to 1965.<sup>1</sup> Again the ratios have the "correct"

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<sup>1</sup>The domestic resource and newly created industry classification used here is patterned after a similar grouping by Pertot, *op. cit.*, Vol. I, pp. 77 ff. The newly-created industries accounted for 8.8 percent of industrial exports in 1952 and 41.2 percent in 1968 (44.0 percent in 1965; the smaller share in 1968 may be a reflection of the reduced level of export promotion following the economic reform of 1965).

TABLE 17

CAPITAL AND LABOR EMBODIED IN YUGOSLAV INDUSTRIAL  
EXPORTS AND IMPORTS, 1968

T r a d e	C a p i t a l ( 0000 ND )	L a b o r (tens of man-years)	C/L
Exports <sup>1</sup>	2 378 527.9	715 139.2	3.33
Imports <sup>1</sup>	3 441 045.1	941 768.5	3.65
Exports <sup>2</sup>	1 237 947.7	428 036.2	2.89
Imports <sup>2</sup>	2 747 911.1	739 945.9	3.71
Exports <sup>3</sup>	971 530.1	230 520.3	4.21
Imports <sup>3</sup>	2 701 544.5	621 878.3	4.34
Exports <sup>4</sup>	3 683 401.4	1 317 252.4	2.80
Imports <sup>4</sup>	3 846 484.4	1 430 958.7	2.69
<sup>1</sup> Sectors 4-21 of Table A-5 <sup>2</sup> Sectors 4,7-10, 14, 15 of Table A-5 <sup>3</sup> Sectors 3, 4, 7-10 of Table A-5 <sup>4</sup> All sectors of Table A-5			

Source: Table A-5

relationship; the capital intensity of imports exceeds that of exports by 3.1 percent. The capital-intensity of this latter import group vis-à-vis the capital-intensity of exports is relatively low, implying that Yugoslavia has a greater comparative advantage in the more traditional products such as textiles (including clothing) and leather and footwear. This is not at all surprising. Nevertheless, based on the model used here, Yugoslav industrial trade is consistent with the nation's labor and capital endowment.<sup>1</sup>

Before ending this section on the foreign trade structure a few comments are in order regarding the geographical structure of Yugoslav exports. The shares of several groups of countries in the exports of various commodity categories were calculated for 1960 and 1972 (Table 18). The lowest shares of the developing countries tend to be in labor-intensive exports, e.g., clothing, footwear, and leather products. This structure is consistent with Yugoslavia's factor endowments vis-à-vis this group of countries. Paper and motor vehicle exports, both capital-intensive, are examples in which the developing countries receive a relatively high proportion of the total (and the developed countries of western Europe and the United States a relatively low proportion). The developing countries received a relatively low, and declining share of iron and steel exports, a capital-intensive good. An explanation for this may be the attraction that steel mills have in the LDCs. High export shares going to the capital-abundant group of nations consisting of the U.S., EEC and EFTA are found in the labor-intensive furniture and textile and leather exports, as well as in the capital-intensive non-ferrous metals. High shares of the

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<sup>1</sup>This is not to imply that the nation's foreign trade structure is optimal.



TABLE 18  
STRUCTURE OF YUGOSLAV EXPORTS, 1960, 1972  
(value in millions of US dollars; share in percent)

SITC	Total value	1960						1972					
		Shares of respective totals						Shares of respective totals					
		U.S.	Eastern Europe	Developing countries	Other	EEC-EFTA/US	Total value	EEC	EFTA	U.S.	Eastern Europe	Developing countries	Other
0-9 TOTAL	566.1	6.8	22.2	15.1	4.7	18.0	237.3	30.5	12.0	6.7	32.4	1.5	32.2
0-8 Manufactures	270.6	9.4	42.5	22.7	8.7	18.0	127.3	30.5	12.0	6.7	32.4	1.5	32.2
0 Food and live animals	163.9	1.3	17.6	5.4	2.3	68.7	131.9	4.8	9.6	4.8	9.9	0.2	77.8
1 Beverages and tobacco	26.5	19.2	40.0	7.2	1.2	51.6	57.8	11.8	4.8	14.4	66.1	0	31.0
2 Chemicals	88.4	4.4	24.5	11.4	2.6	60.3	185.4	42.9	7.4	0.8	25.4	0.4	56.1
3 Mineral fuels	5.1	19.6	19.8	12.6	56.7	17.8	15.7	15.7	37.3	0.8	30.8	0	73.6
4 Animal and vegetable oil and fats	1.3	61.2	22.9	-	13.4	61.5	1.1	63.6	36.4	-	61.4	0	100.0
5 Chemicals	22.9	21.2	47.6	16.2	27.1	142.9	20.4	6.7	2.6	2.6	6.9	2.0	29.7
6 Manufactures classified by materials	134.0	13.3	36.9	21.4	3.0	38.7	603.3	26.0	15.1	10.6	37.7	1.4	52.0
61 Leather and manufactures	3.9	12.8	30.5	5.1	5.4	24.7	39.5	39.5	14.6	10.1	6.9	4.0	81.2
63 Wood and cork	13.4	14.2	40.3	12.7	43.3	34.5	27.5	16.8	16.8	3.2	29.0	0.6	49.5
64 Paper manufactures	2.4	4.5	29.2	36.2	4.5	73.9	23.8	4.4	4.4	35.0	19.5	0.7	38.2
65 Textile yarn and fabrics	18.1	13.3	33.7	33.7	42.1	103.7	31.9	11.4	2.3	34.0	7.7	0.7	51.6
66 Non-metallic mineral manufactures	8.3	4.8	26.2	30.0	36.1	28.1	63.4	5.0	5.0	3.2	41.6	0	51.6
67 Non-ferrous metal manufactures	24.8	23.9	39.3	12.9	43.4	223.1	18.4	9.2	4.3	60.2	6.0	1.6	37.0
7 Machinery and transport equipment	84.6	6.7	52.1	34.2	7.7	246.6	18.9	24.9	21.8	23.6	71.0	2.4	67.0
71 Electrical machinery	27.1	27.1	26.6	69.0	0.7	130.5	16.4	10.3	2.1	50.3	15.6	2.7	43.9
72 Non-electrical machinery	24.0	15.6	29.8	14.4	2.7	146.2	24.6	14.2	4.5	31.5	24.8	5.1	24.8
73 Transport equipment	2.2	4.0	49.1	21.3	10.9	20.2	26.0	16.9	0.2	0.2	11.5	0.2	43.0
732 Road motor vehicles	18.6	27.6	32.3	23.7	29.6	162.4	28.0	2.3	0.2	1.3	25.1	0.2	31.2
733 Ships and boats	1.1	1.1	1.1	1.1	1.1	1.1	1.1	66.8	66.8	-	0.1	4.6	73.3
8 Miscellaneous manufactures	28.1	20.2	36.5	2.1	39.0	320.6	32.7	9.2	13.5	50.8	1.7	1.1	46.4
81 Furniture	13.3	37.6	16.5	-	81.2	67.5	27.2	10.0	35.9	16.2	6.8	0.9	76.1
84 Clothing	6.2	1.6	43.5	-	51.6	135.8	23.2	9.7	7.8	58.5	0.5	0.3	40.7
85 Footwear	8.6	9.3	79.1	-	16.3	94.9	17.4	5.6	3.7	71.8	-	1.5	26.7

Source: OECD, *Yearbook of Foreign Trade*, Series B, No. 4, 1961 and 1972.

eastern European nations can be found in non-ferrous metals and in such labor-intensive exports as footwear, textiles and clothing.

Thus the export shares of the various country-groups do not present a clear-cut case either for or against the proposition that the direction of exports makes sense from a factor endowment viewpoint.<sup>1</sup> Nevertheless, the directional pattern of exports does provide some encouragement for those who believe that there is some order in international commodity trade. The combined shares of the U.S., EEC and EFTA in 1972 were higher than in 1960 for all the SITC 5-8 export categories found in Table 18 except for those in SITC sector 8. An explanation for this may be that scale economies, increases in the quality of the labor force, and learning factors have helped to increase the quality and price competitiveness of Yugoslavia in these goods vis-à-vis the developed countries.<sup>2</sup> The shares of the developing countries in the SITC 5-8 categories were lower in the majority of cases in 1972 than in 1960. In the machinery and transport equipment sector, declines of these shares were accompanied mainly by increases in the shares of the developed market economies of western Europe and the U.S. as opposed to the eastern European nations. This would appear to be further evidence of an increasing sophistication of Yugoslav production.

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<sup>1</sup>An application of the above type of test to geographically disaggregated exports would perhaps shed additional light on the nature of Yugoslavia's exports to countries with different relative factor endowments.

<sup>2</sup>Changes in tariff levels may also have been a contributing factor.

## 6. Regional Inequalities

The growth of total and industrial product under the system of workers' self-management in Yugoslavia has been rapid from both an absolute standpoint and in relation to the experiences of other nations of the world. Nevertheless, the country has been unable to overcome a lingering depressed areas problem. Some information of regional economic development in Yugoslavia is presented in Table 19. Although the areas officially designated as underdeveloped have varied somewhat over time, a good approximation of these "insufficiently developed" areas, as they were termed in the 1966-1970 Five Year Plan, would include the republics of Bosnia and Herzegovina, Montenegro, and Macedonia, and the autonomous province of Kosovo. These regions currently account for about 40 percent of the area, 35 percent of the population and 21 percent of the social product of Yugoslavia.

The social product of the less developed regions increased from 1959 to 1970 by a factor of approximately 2, as did the social product of the developed areas. However a more rapid rate of population growth in the former led to a slower rate of increase of per capita product. Per capita social product in the less developed regions (LDRs) grew at an annual compound rate of 4.9 percent from 1959 to 1970, while in the more developed areas (MDRs) the rate of increase was 5.8 percent. The situation then is one in which per capita income has been increasing at a reasonably rapid rate in the less developed regions but at the same time the income gap between the

rich and the poor regions has been widening.

The government has maintained a goal of achieving a more equal level of income in the various republics and autonomous provinces. The major policy that has been used in attempting to realize this goal has consisted of providing preferential investment treatment to the less developed areas, i.e., these areas were given special priority in the allocation of investment funds and in the rate of interest paid on funds. These investments were aimed towards bringing about a rapid and intensive industrialization of the regions and thereby a narrowing of the income gap. The ratio of gross fixed investment to the social product from 1953-1969 (Table 19) was 35.0 percent in the less developed regions compared to 24.2 in the more developed. However in the mid-1960s the role of banks and enterprises as a source of investment funds increased considerably.<sup>1</sup> Consequently the share of gross fixed investment in the social product in the rich and the poor regions has moved closer together.

The growth of industrial value added was more rapid in the LDRs than in the MDRs in 1952-1970, the annual compound growth rates being 11.6 and 10.8 respectively. The LDRs' share of Yugoslav industrial value added has increased from 18.5 to 20.7 percent.

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<sup>1</sup>The share of investment funds coming from enterprises and banks was about 38 percent in 1960 and 84 percent in 1970 (Statistički Godišnjak SFRJ, 1967, p. 254, 1971, p. 248).

TABLE 19  
SOME INDICATORS OF REGIONAL ECONOMIC DEVELOPMENT

		Bosnia & Herzegovina	Montenegro	Croatia	Macedonia	Slovenia	Serbia
Population	1952	2,791	416	3,913	1,280	1,498	6,900
	1959	3,185	460	4,115	1,377	1,569	7,508
	1970	3,703	525	4,411	1,629	1,718	8,385
Social Product (b. ND, 1966 prices)	1959	7.9	.9	16.0	3.0	8.4	25.4
	1970	14.5	2.4	32.9	6.9	19.4	47.6
Social Product per Capita (1966 prices, ND)	1959	2,397	2,012	3,879	2,172	5,334	3,377
	1970	3,925	4,499	7,463	4,223	11,305	5,678
Index of Social Product per Capita (1966 prices)	1959	100	100	100	100	100	100
	1970	164	223	192	194	212	168
Social Product (Value Added) in Industry (1966 prices, m. ND)	1952	805	48	2,151	246	1,532	2,195
	1970	5,469	695	11,587	2,238	8,949	16,174
Index of Industrial Social Product per Capita 1952 = 100		683	1,448	538	910	584	737
Share of Industrial Value Added (1966 prices)	1952	11.5	0.7	30.8	3.5	22.0	31.5
	1970	12.7	1.5	25.7	5.0	19.8	35.9
Fixed Assets per Worker in Industry 1952 (oooND, 1966 prices)	1952	43.6	71.3		44.2		
	1970	109.8	152.6	89.2	84.2	91.6	83.8
Gross Fixed Investment as Percent of the Social Product (1966 prices)	1953-69	29.9	52.6		43.8		
Share of Industrial Invest- ment	1952	27.3	3.3	20.7	4.9	14.6	29.0
	1970	13.4	3.8	19.8	8.1	15.1	39.8

(Continued)

TABLE 19, SOME INDICATORS OF REGIONAL ECONOMIC DEVELOPMENT (Continued)

		Serbia Proper	Vojvodina	Kosovo	Underdeveloped Regions	Developed Regions	Yugoslavia
Population	1952	4,352	1,694	780	5,267	11,531	16,748
	1959	4,763	1,824	921	5,943	12,291	18,214
	1970	5,219	1,946	1,220	7,077	13,294	20,371
Social Product (b.ND, 1966 prices)	1959	16.4	7.7	1.2	13.7	48.5	61.6
	1970	31.5	13.6	2.6	26.3	97.4	123.7
Social Product per Capita (1966 prices, ND)	1959	3,438	4,243	1,349	2,204	3,952	3,349
	1970	6,030	6,979	2,111	3,716	7,327	6,074
Index of Social Product per Capita (1966 prices)	1959	100	100	100	100	100	100
	1970	175	164	157	169	185	180
Social Product (Value Added) in Industry (1966 prices, m. ND)	1952	1,377	627	192	1,291	5,686	6,977
	1970	11,332	3,938	904	9,333	35,773	45,106
Index of Industrial Social Product per Capita 1952 = 100		823	628	471	723	629	646
Share of Industrial Value Added (1966 prices)	1952	19.7	9.0	2.8	18.5	81.5	100
	1970	25.1	8.7	2.0	20.7	79.3	100
Fixed Assets per Worker in Industry 1952 (oooND, 1966 prices)	1952			52.4	45.7	51.4	50.2
	1970	79.0	87.2	124.0	108.2	85.9	91.3
Gross Fixed Investment as Percent of the Social Product (1966 prices)	1953-69			29.1	35.0	24.2	26.6
Share of Industrial Invest- ment	1952						
	1970	28.2	6.6	5.0	30.3	69.7	100

Source: Statistički Godišnjak SFRY, 1954, 1963, 1972.

Note: ND = new dinars.

Industrial production in Yugoslavia has become considerably more capital-intensive (in terms of fixed assets per worker) over time. But whereas in 1952 the fixed assets per worker in industry in the MDRs exceeded that in the LDRs by about 12 percent, by 1970 this relationship had been turned around and the fixed assets per industrial worker in the LDRs was about 25 percent greater than in the MDRs. It would appear then that either investment in the LDRs was directed towards relatively capital-intensive industries to a greater extent than in the MDRs or else production for given industries was more capital intensive in the LDRs. The former explanation explains at least part of the difference in capital intensity; more than 52 percent of the industrial investment in the LDRs during 1952-1969 was in the relatively capital-intensive industries of coal mining, steel, non-ferrous metals and non-metallic minerals as compared to only 30 percent in the MDRs. This pattern of investment may at least partly be attributable to the natural resource endowments of the regions. It also seems likely however that the relative labor abundance of the LDRs has not been fully exploited. J. Plummer in a recent study estimated that the 1962 level and composition of industrial production could have been achieved with 81.0 percent of the actual capital used. On a North-South regional division, industrial production in the Northern Republics could have been achieved with an estimated 85.3 percent of the actual capital and in the Southern republics with 78.0 of the actual capital.<sup>1</sup>

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<sup>1</sup> James L. Plummer, "Inter-Firm Production Function Analysis of Yugoslav Industrial Resource Allocation", Journal of Industrial Economics, Vol. XIX, No. 1, November 1970, Table II.

## 7. The Structure of Industrial Enterprises According to Size

It is well known that the size of the firm has implications regarding economic efficiency (both static and dynamic). Thus an examination of the size structure of a nation's industrial sector can provide information concerning the efficiency of industrial production. An examination of the size structure of Yugoslav industrial enterprises reveals that the number of enterprises has fallen from 3,254 in 1939 to 2,374 in 1970.<sup>1</sup> Although the number of enterprises in 1970 was slightly larger than in 1953, there has been a considerable decrease in the number and share of small enterprises (125 or less employees) during this period. The share of firms in this size category declined from 64.9 percent of industrial enterprises in 1953 to 39.5 in 1961 and 28.1 in 1970. The share of industrial employment, fixed assets and social product associated with small enterprises has also decreased.<sup>2</sup> Only about 3 percent of industrial workers were employed by these small firms in 1970. This pattern of change in the size structure of industrial enterprises has probably been a positive factor in the industrial growth in Yugoslavia in that it made increases in production efficiency possible through the realization of economies of scale.

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<sup>1</sup>The big decrease took place soon after the end of World War II. As seen in Table 20, the number in 1961 exceeded that in 1953; a decline occurred from 1961 to 1970, when the number approximated that of 1953.

<sup>2</sup>The data in Table 20 actually understate the importance of large enterprises. This is because it is common for Yugoslav industrial enterprises to become members of groups of firms in which certain firm functions are centralized.



TABLE 20

## INDUSTRIAL ENTERPRISES ACCORDING TO NUMBERS EMPLOYED, 1953, 1961, 1970

Industrial Sector Characteristic	Total	Enterprise Distribution According to Number of Persons Employed(percent)								
		Less Than 16	16-29	30-60	61-125	126-250	251-500	501-100	1001-2000	More Than 2000
Number of Enterprises 1953	2,330	13.1	11.8	18.6	21.4	15.0	10.3	5.6	4.7	4.7
Number of Enterprises 1961	2,787	3.3	4.4	10.3	21.5	21.8	18.1	11.5	5.8	3.2
Number of Enterprises 1970	2,374	3.3	2.6	6.3	15.9	22.0	20.0	14.6	9.3	5.9
Number of Employees 1961	1,137,737	0.7	0.2	1.2	4.7	9.6	15.7	19.8	19.8	28.9
Number of Employees 1970	1,452,109	0.1	0.1	0.5	2.4	6.6	11.8	17.2	21.0	40.5
Active Fixed Assets (purchase value, m.ND) 1961	26,871	less than 0.5	0.2	1.6	5.7	8.4	16.0	18.4	17.9	33.8
1970	102,385	less than 0.5	0.7	0.9	3.1	6.4	10.5	15.5	21.3	42.2
Social Product (m.ND) 1961	14,237	0.1	0.2	1.1	3.9	8.1	13.6	19.9	22.9	30.2
Social Product (m.ND) 1970	55,285	0.1	0.1	0.8	2.5	6.4	10.7	16.8	20.7	42.0

Source: Statistički Godišnjak SFRY, 1954, 1963, 1972.

The rationalization in terms of size of industrial enterprises takes on a greater scope when viewed against the situation in another southern European semi-industrialized country, Spain.<sup>1</sup> In 1968, 97.3 percent of the manufacturing firms in Spain employed 100 or fewer persons, while as stated above only 28.1 percent of Yugoslav industrial enterprises employed 125 or fewer persons in 1970. The 3 percent of Yugoslav industrial workers employed in small firms appears even smaller when compared with the 49.4 percent of manufacturing workers in Spain employed by firms employing 100 or less persons. In the same years, 78.7 percent of Yugoslav industrial employment was in firms employing more than 500 persons each, while in Spain the percentage was 22.8.

The predominance of large enterprises is a unique feature of Yugoslav industry, given the nation's stage of development. This large firm orientation can be expected to affect efficiency in two principal ways. The possibility of realizing greater economies of scale would have a positive effect on efficiency. On the other hand, larger and fewer firms imply greater monopoly power and increase the likelihood of collusion. However the largest industrial enterprise in Yugoslavia, the oil concern INA, has assets that are less than 2 percent of those of Standard Oil Company of New Jersey, the largest United States oil firm. The United States Steel Corporation is fifty times as large as Yugoslavia's largest steel enterprise.<sup>2</sup> The feeling here is that the orientation of Yugoslav

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<sup>1</sup> Spain and Yugoslavia are at similar stages of development and have experienced relatively rapid industrial expansion. The data on Spain are taken from J.B. Donges, "From an Autarchic Towards a Cautiously Outward-Looking Industrialization Policy: The Case of Spain", Weltwirtschaftliches Archiv, Band 107, Heft 1, 1971, Table 4.

<sup>2</sup> The comparisons are from Dirlam and Plummer, op. cit., p. 75.

industry towards the relatively large enterprise has been a positive factor in industrial growth and resource efficiency. This feeling is strengthened by Vanek's argument that the optimum size of firm tends to be smaller and the structure of industry more competitive in a labor-managed system than in other types of market economies. (Yugoslav enterprises, as noted above, do not appear so large when compared with firms in the industrialized countries).<sup>1</sup>

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<sup>1</sup>Jaroslav Vanek, The General Theory of Labor-managed Market Economies, Ithaca, N.Y., Cornell University Press, 1970, p. 272.

## V. CONCLUDING REMARKS

This paper provides evidence that frequent and major institutional change can go hand-in-hand with rapid economic growth.

Industrialization in Yugoslavia has taken place under conditions of a reasonable degree of openness of the economy. Progress continues to be made in this direction. Six devaluations of the dinar have occurred since 1951. A limited foreign exchange market has been established and was followed by a float of the dinar. Foreign exchange reserves have been increasing. Twenty-three joint ventures were established in 1972 compared to four in 1967 and 1968. Tariffs were reduced from one to twelve percent on about 1000 items in 1972. Inflation and the trade balance continue to be problems. Overall, however, the performance of the economy deserves high marks. Change and experiment will no doubt continue to be features of the Yugoslav system as it attempts to solve its problems.

A P P E N D I X

Table A-1

STRUCTURE OF YUGOSLAV INDUSTRIAL INVESTMENT 1952-1956,  
1956-1961, 1961-1965, 1965-1970  
(Average Percentage)

Industry Branch	1952-56	1956-61	1961-65	1965-70
Electricity	23.3	22.8	19.9	25.7
Coal and Coke	8.1	9.3	5.4	5.2
Crude Petroleum	3.5	2.1	3.8	3.9
Ferrous Metallurgy	16.2	5.5	10.5	12.7
Non-ferrous Metals	8.4	6.8	5.2	8.1
Non-metals	6.1	3.0	2.5	2.2
Manufacture of Metals	6.5	6.4	9.8	7.2
Shipbuilding	.6	.9	.9	.9
Manufacture of Electrical Machinery, appliances and supplies	2.4	1.7	3.0	2.8
Chemicals	6.8	6.8	8.8	7.8
Building Materials	1.0	2.7	2.7	2.8
Manufacture of Wood	3.2	3.7	3.7	3.0
Paper	2.6	3.3	5.2	2.2
Textiles	3.9	6.3	7.3	4.7
Leather	.5	1.1	.9	.8
Rubber	.3	.6	.9	.7
Food Industries	4.8	8.4	5.3	5.0
Printing & Publishing	.6	1.1	1.3	1.6
Tobacco Manufacture	.5	.8	.6	.7
Motion Picture	.1	.2	.1	-
Mining Explorations	-	.4	1.3	.4
Miscellaneous Manufactures	1.0	3.6	1.0	1.2

Source: Industrijska Preduzeća, 1968, 1970.

Table A-2

## SELECTED INDICATORS OF PRICE MOVEMENTS, 1952-1972

	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
Index of Prices of Manufactured Goods <sup>1</sup> 1966 = 100	68	66	65	68	69	69	69	70	71	74
Index of Prices of Agricultural Goods <sup>1</sup> 1966 = 100	20	24	25	28	29	32	33	32	34	39
Index of Prices of Retail Prices 1966 = 100	40	40	38	41	43	43	44	45	48	52
Cost of Living Index 1966 = 100	29	30	29	33	36	37	38	39	43	46
Ratio of Index of Prices of Manufactured Goods to Agricultural Goods	3.4	2.8	2.6	2.4	2.4	2.2	2.1	2.2	2.1	1.9
Rate of Inflation as shown by the implicit social product deflator (percent)	-	-0.3	13.0	3.8	10.5	-0.3	-1.6	4.5	11.3	10.4

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Index of Prices of Manufactured Goods <sup>1</sup> 1966 = 100	74	75	78	90	100	102	103	106	116	133	148
Index of Prices of Agricultural Goods <sup>1</sup> 1966 = 100	44	48	60	86	100	97	93	102	117	143	183
Index of Prices of Retail Prices 1966 = 100	55	58	63	81	100	107	112	120	131	151	174
Cost of Living Index 1966 = 100	51	54	60	81	100	107	112	121	134	155	181
Ratio of Index of Prices of Manufactured Goods to Agricultural Goods	1.7	1.6	1.3	1.0	1.0	1.1	1.1	1.0	1.0	0.9	0.8
Rate of Inflation as shown by the implicit social product deflator (percent)	7.6	8.0	19.5	28.4	14.7	2.1	3.8	6.7	12.4	19.4	14.7
Note: 1) producer's prices											

Sources: Statistički Godišnjak SFRJ, 1971, 1973; Jugoslavija, 1945-1964.

Table A - 3

## INDEX OF INDUSTRIAL PRODUCTION, 1939-1970

(1952 = 100)

Industry	1939	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Electrical Energy	43	43	54	76	82	89	95	111	127	161	184	231	272	300	330	367	417	500	524	573	633	689	761	853	968	1000	
Coal & Coke	70	58	80	90	103	107	100	97	113	131	146	152	157	174	184	191	190	209	223	224	219	197	200	197	204	223	
Crude Petroleum	24	14	21	36	57	89	98	130	153	172	191	247	278	329	439	561	662	724	828	981	1167	1277	1315	1469	1704	1951	
Ferrous Metals	57	44	70	83	86	86	91	118	150	197	222	277	304	346	388	405	416	430	473	508	533	528	576	637	725	810	
Non-Ferrous Metals	69	46	62	71	82	90	94	102	107	130	145	162	174	184	207	228	261	285	294	312	321	333	356	393	416	426	
Non-Metallic Mineral Products	38	39	57	72	92	90	97	134	149	179	209	241	272	303	356	389	432	388	594	647	695	686	741	860	955	1134	
Manufacture of Metals	38	35	58	76	92	101	100	127	139	161	170	199	224	267	327	342	342	387	486	526	523	501	525	603	669	722	
Electrical Machinery	12	18	28	52	73	72	78	132	155	198	229	310	378	464	576	645	725	913	1205	1262	1320	1360	1484	1789	1916	2179	
Chemicals	61	42	73	88	97	98	100	108	134	179	217	256	314	400	452	506	563	718	865	1049	1200	1218	1414	1727	2006	2336	
Building Materials	61	49	79	92	99	102	89	109	116	126	129	152	165	186	212	228	212	242	277	287	288	302	334	371	403	448	
Wood	81	55	86	117	138	144	118	106	110	119	121	140	150	180	208	228	254	287	339	363	373	357	377	413	441	492	
Paper Products	72	66	84	95	101	103	106	114	122	149	207	233	248	275	328	404	491	583	720	830	894	982	1066	1140	1212	1319	
Textiles	84	67	103	130	133	127	110	97	120	138	145	167	181	196	224	230	256	295	334	357	385	373	387	408	426	458	
Leather	78	63	103	140	162	150	127	92	105	123	137	157	172	199	240	258	272	318	388	409	414	401	400	439	431	475	
Rubber	60	37	83	93	116	111	110	100	118	125	147	184	195	220	277	296	306	377	467	514	553	570	568	681	731	814	
Food Industries	88	75	115	139	125	116	137	133	145	154	173	226	234	272	320	346	368	425	472	506	549	560	559	608	674	753	
Tobacco	79	50	88	126	126	117	85	87	125	130	150	128	183	143	141	114	97	147	207	222	200	201	203	184	187	196	
TOTAL INDUSTRY	61	48	73	91	102	105	101	111	126	147	162	189	210	238	274	292	314	363	421	455	474	473	503	560	611	674	

Source: Industrija 1971, Beograd, 1972.

TABLE A - 4  
SOURCES OF INDUSTRIAL GROWTH ( based on current price data )  
(percentages)

	1952-56			1956-61			1961-65			1965-70			1952-61			1961-70		
	IS	EE	DD	IS	EE	DD	IS	EE	DD	IS	EE	DD	IS	EE	DD	IS	EE	DD
Electrical Energy.....	21.6	11.3	67.1	7.2	3.6	89.2	- 9.1	29.2	79.9	- 2.6	8.6	94.0	13.6	4.1	82.3	- 5.8	12.4	93.4
Coal and coke.....	14.1	10.4	75.5	0.04	10.4	89.6	29.6	9.2	61.2	-38.9	26.8	112.1	8.9	10.0	81.1	9.2	15.0	75.8
Crude Petroleum.....	39.1	3.5	57.4	24.4	7.9	67.7	- 3.4	17.2	86.2	- 0.02	4.0	96.0	41.0	5.3	53.7	- 1.9	6.6	95.3
Ferrous Metallurgy.....	74.4	25.2	0.4	-57.6	18.0	139.6	34.7	23.9	41.4	-68.0	30.1	137.9	22.0	15.6	62.4	-11.2	25.1	65.1
Non-Ferrous Metallurgy.....	34.1	-15.3	81.2	-66.5	29.0	137.5	26.2	51.8	22.0	-45.0	54.3	90.7	- 7.6	6.9	100.7	- 9.5	48.3	61.2
Non-Metallic Mineral Products.....	33.9	19.5	46.6	-66.3	34.0	132.3	20.2	31.4	48.4	-43.8	17.9	125.9	0.3	23.7	76.0	- 9.5	22.1	87.4
Metal Products.....	55.0	6.2	38.8	-17.9	14.5	103.4	41.6	18.6	39.8	-21.6	7.2	114.4	20.3	10.0	69.7	15.9	9.9	74.2
Ship-Building.....	19.0	31.2	87.8	7.6	22.4	70.0	- 6.7	95.0	13.7	-16.0	47.3	68.7	- 4.8	25.9	78.9	-16.6	62.6	54.0
Electrical Machinery, Apparatus.....	65.8	6.2	28.0	- 1.4	16.1	85.3	30.2	20.3	49.5	- 1.4	13.0	88.4	48.2	8.5	43.3	19.5	13.3	67.2
Chemicals and Chemical Products.....	21.4	9.2	69.4	8.9	9.3	81.8	30.9	18.9	50.2	-14.3	15.8	98.5	19.3	8.5	72.2	16.7	15.2	68.1
Building Materials.....	14.4	8.2	77.4	4.5	1.2	94.3	3.7	4.8	91.5	- 7.2	3.4	103.8	11.5	2.0	86.5	- 2.6	3.8	93.8
Wood.....	6.9	25.6	67.5	- 4.7	21.6	83.1	4.4	25.8	69.8	-10.7	12.4	98.3	- 1.1	22.2	78.9	- 4.5	16.3	88.2
Paper and Paper Products...	38.9	9.8	51.3	-23.6	16.2	107.4	20.9	29.3	49.8	-34.7	18.7	116.0	14.4	12.0	73.6	- 5.0	21.0	84.0
Textiles.....	4.2	33.8	62.0	-20.5	18.0	102.5	27.4	16.1	56.5	2.4	21.2	76.4	-13.7	21.9	91.8	22.2	17.1	60.7
Leather.....	20.2	19.0	51.8	- 0.5	19.6	80.9	- 2.1	45.8	56.3	-36.2	39.0	97.2	18.4	17.7	63.9	-22.7	42.1	80.6
Rubber Products.....	38.2	0.0	61.8	15.8	3.2	81.0	17.9	10.9	71.2	- 2.6	10.8	91.8	30.8	2.2	67.0	10.9	10.2	78.9
Food Industries.....	28.3	0.8	70.9	7.0	12.4	80.6	9.5	6.7	83.8	2.6	4.6	92.8	24.3	7.8	67.9	7.6	5.1	87.3
Printing, Publishing.....	16.4	0.0	83.6	3.3	1.6	95.1	0.4	3.6	96.0	3.0	2.3	94.7	13.3	1.2	85.5	2.5	2.6	94.9
Tobacco.....	0	38.2	61.8	0	-14.8	114.8	0	59.9	40.1	-14.1	-14.1	128.2	0	13.7	86.3	- 3.9	39.5	64.4
Motion Picture Production..	-55.6	0.0	155.6	34.5	8.4	57.1	0	-910.0	1010.0	- 7.8	17.0	90.8	- 9.5	3.8	105.7	- 7.6	0.0	107.6
POPAL <sup>1</sup> .....	26.9	17.4	55.8	-15.1	14.7	100.4	19.7	20.3	60.0	-16.1	15.9	100.2	7.2	14.3	78.5	5.2	17.9	76.9

<sup>1</sup>Weighted average (gross output weights)

Source: Yugoslav Input-Output Table, 1962, 1966; Statistički Godišnjak SFRJ; Statistički Spolzne Tevovine.  
Exchange rates used to obtain direct export and import values: 7.50 dinars per US dollar for 1952-1956, 1956-1961, 1952-1961 (1962 input-output table used in these periods); 12.50 dinars for the remaining periods (1966 input-output table used in these periods). See text for method of calculation.



TABLE A- 5

TOTAL CAPITAL AND LABOR REQUIREMENTS OF YUGOSLAV EXPORTS AND IMPORTS, 1968

	Total Capital Re- quirements of Ex- ports (00000 ND)	Total Labor Re- quirements of Ex- ports (man-years)	Total Capital Re- quirements of Im- ports(00000 ND)	Total Labor Re- quirements of Im- ports (man-years)
Electricity	107.02	65.51	997.30	610.43
Coal-Production and Processing	184.16	398.99	5,984.71	12,965.72
Crude Petroleum and Processing	2,109.41	2,495.89	16,265.30	19,245.38
Ferrous Metallurgy	9,960.02	15,601.44	43,334.53	67,879.48
Non-ferrous Metallurgy	37,172.11	60,792.01	22,988.20	37,595.36
Non-Metals - Production and Processing	4,193.23	14,262.23	8,200.60	23,804.88
Metal Products	28,661.63	78,014.06	129,729.17	353,109.65
Shipbuilding	22,279.53	55,152.28	6,110.57	15,126.51
Electrical Machinery and Supplies	16,586.55	43,798.09	25,146.61	66,401.60
Chemicals	17,555.87	35,458.54	49,568.27	100,115.68
Building Materials	1,317.91	3,593.81	1,560.65	4,255.74
Manufacture of Wood	40,201.76	71,253.77	4,045.15	7,169.64
Paper	15,352.08	16,321.02	13,411.30	14,257.75
Textiles	20,026.90	128,228.49	18,994.43	121,617.79
Leather and Footwear	8,724.27	71,783.28	1,907.53	15,695.14
Rubber Products	625.67	2,125.40	4,354.47	14,825.96
Food Manufactures	9,964.43	83,073.62	10,019.70	83,534.40
Printing and Publishing	425.63	987.64	1,359.35	3,154.28
Tobacco Manufactures	3,712.92	30,650.87	120.96	998.55
Motion Picture Production	82.87	218.30	52.61	138.59
Miscellaneous Manufactures	1,009.41	3,824.35	3,190.41	12,087.49
Agriculture	22,719.14	433,768.09	4,121.36	432,764.28
Forestry	10,638.86	7,863.03	4,635.27	3,425.86
Construction	3,000.06	11,330.27	-	-
Transport and Communications	79,770.54	104,402.95	11,030.01	14,435.98
Trade and Catering	11,498.54	38,927.80	1,152.54	3,901.88
Service Rendering Arts and Crafts	289.84	1,986.30	-	-
Public Utilities	-	-	-	-
Scrap and Wastes	169.78	874.32	357.44	1,840.71
TOTAL	368,340.14	1,317,252.35	384,648.44	1,430,958.73

Source: Statistički Godišnjak SFRY, 1970; Yugoslav Input-Output Table, 1968; Yugoslav Survey, Vol. 11, No. 2, May 1970; sector 29 inputs estimated.

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