Economic Intelligence Report

INVESTMENTS, FIXED ASSETS, AND OUTPUT IN CZECHOSLOVAK INDUSTRY 1949–60

CIA/RR ER 61–39

August 1961

CENTRAL INTELLIGENCE AGENCY

Office of Research and Reports

CONFIDENTIAL

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INVESTMENTS, FIXED ASSETS, AND OUTPUT IN CZECHOSLOVAK INDUSTRY* 1949-60

Summary and Conclusions

The rapid industrial development in Czechoslovakia in 1949-60 was supported by a large investment program. An average of about 14 percent of the gross national product (GNP) is estimated to have been used for industrial investments, most of which were directed to heavy industry, especially to the basic materials branches.

The Czechoslovak regime has constantly maintained emphasis on heavy industry, although significant changes have occurred in investment policy. Industrial investments increased rapidly during 1949-52, declined or stabilized during 1953-55, and increased rapidly once again during 1956-60.. In the distribution of industrial investments, there was a substantial shift during 1953-57 in favor of basic materials, especially fuels and power, at the expense of machine building and light industry. Since 1957 the share of machine building in investments has risen slightly in response to the high investment and export requirements of the Third Five Year Plan (1961-65). These changes in investment policy occurred earlier than similar changes in most of the other Satellite countries. By making relatively prompt adjustments in investments, the Czechoslovak regime was able to anticipate reasonably well the prospective requirements for heavy industrial products. Thus the short-term flexibility in investment policy has promoted the longer term basic objectives of the regime.

As a result of the investment program, fixed assets in industry grew at an average annual rate of 5.8 percent during 1949-60, and the rate of growth of fixed assets increased during the same period. Because of the timelag between investments and the completion of new facilities, there has been a substantial backlog of unfinished investments. On the other hand, retirements of old assets were very small until 1957 or 1958.

Industrial production increased faster than fixed assets, at an average annual rate of 8.1 percent in 1949-60. Consequently, average capital-output ratios -- the ratios of fixed assets to net output -- declined, especially in machine building and light industry. This decline occurred even though technological development was not particularly

* The estimates and conclusions in this report represent the best judgment of this Office as of 1 August 1961.

rapid and the industrial structure was becoming more capital-intensive. Increased utilization of existing production capacity probably accounted for nearly all of the decline in capital-output ratios.

Most of the decline in capital-output ratios occurred in 1949-51, and further declines have taken place since then, mainly in machine building and light industry. In these two sectors, substantial excess capacity persisted throughout 1949-60, and the changes in capital-output ratios depended mainly on supplies of materials and labor. In most of the basic materials branches, however, the productive capacity of old plants was already fully utilized by around 1951. Fluctuations in the capital-output ratios since then have reflected changes in commissioning new facilities and inability for technical and organizational reasons to use these facilities efficiently at the beginning. Changes in the rate of growth of materials and labor inputs and in the rate at which new facilities were being completed appear to explain the rise in capital-output ratios in 1952-54, the sharp decline in 1955-57, and the relatively slow decline in 1958-60.

Plans for 1961-65 call for about the same rates of growth in total output and in the main industrial sectors -- machine building, basic materials, and light industry -- as were achieved in 1956-60. Planners also appear to assume that the trends since 1958 in the relationship of fixed assets to output will continue: the over-all capital-output ratio will decline slowly, and on the average the ratios will remain about constant in the basic materials branches while continuing to decline in machine building and light industry.

Investment costs per added unit of output will be substantially higher than in 1956-60, however, because of planned increases in the backlog of unfinished investments and in the rate of retirements. The building of new plant in basic industries, especially in metallurgy, mining, petrochemicals, and rubber, will be accelerated, and this activity will tend to increase unfinished investments because of the long construction periods. Increased retirements will result from the greater emphasis on mechanization and on technological improvements. On the other hand, technological improvement is expected to save not only on labor, the supply of which will increase less than in the past 5 years, but also on capital. Thus the plans for the productivity of assets may depend heavily on the degree of success in introducing new technology.

Reliance on new technology may constitute a major weakness in the plan. Some of the published goals for technological change appear optimistic, and the plan also relies heavily on imports of raw materials from the USSR. Some favorable trends, however, will assist in

achieving output goals. The length of the construction period has been reduced considerably during the past 5 years and may be reduced further. Construction of many of the facilities that will be needed during 1961-65 was begun during 1956-60. Industrial investments have been rising ever since 1956, so that sharp fluctuations in the growth of assets probably will be avoided. On balance, it does not appear that the investment requirements of the production plan are grossly understated.

I. Introduction

A. Czechoslovak Investment Policy

In 1948, when the Communists came to power, Czechoslovakia had regained its prewar level of industrial output and in terms of per capita production of key commodities was more industrialized than Italy, although less so than France. After 1948, economic policies common to the entire Soviet Bloc promoted a rapid growth of industrial production that in Czechoslovakia averaged 8.1 percent a year. This rate was exceeded by only a few Western European countries, such as West Germany, Austria, and Italy.

Maintaining rapid expansion of heavy industry has been a constant goal of the Czechoslovak Communists. The principal support for this policy has been an extremely large investment program in heavy industry. Industrial investments, including capital repairs and valued at factor cost, increased from 8 percent of the GNP in 1948 to an average rate of 14 percent in 1952-58 and to about 21 percent in 1960 (see Table 8*). About 85 percent of these investments were directed to heavy industry. The rapid buildup of heavy industry permitted output to increase by an average annual rate of 11.2 percent in machine building and 9.4 percent in the branches producing basic materials and power. Light industry, however, experienced a relatively slow growth in output.

Within the limits of its over-all priorities the Czechoslovak regime was quick to change its investment pattern in response to changes in the economic situation. To halt the deterioration of living standards and to avoid a shortage of raw materials and power, investments in industry were cut back and reallocated in favor of raw materials, power, housing, and agriculture as early as the beginning of 1953 (see Tables 1 and 7**). These measures were aspects of the policy of "proportionate growth" (called the "new course" elsewhere in the Bloc), which was instituted in 1953 in Czechoslovakia rather than 1954 as in the other Satellites. Then, with the improvement in the level of consumption and reduced strain on industrial resources, Czechoslovakia began a new investment drive in 1956, whereas some of the other Satellites did not do so until 1958.

By making relatively prompt adjustments in investments, the Czechoslovak regime was able to anticipate reasonably well the prospective requirements for heavy industrial products, and this policy of short-term flexibility of investment has promoted the longer-term objectives of the regime.

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* Appendix A, p. 45, below.
** Appendix A, pp. 36 and 44, respectively, below.

B. Analytical Approach

The principal purpose of this report is to explore the role of investments in the industrial development of Czechoslovakia between 1948 and 1960. Investments affect production, however, only after they have resulted in installations of plant and equipment -- that is, additions to or modifications of fixed assets. The following analysis, therefore, proceeds in two stages. Section II contains an analysis of factors that have determined the effect of investments on the growth of fixed assets in Czechoslovak industry. Such factors include the amount and composition of assets at the beginning of the Communist period, the growth and distribution of gross investment during the Communist period, the rate at which investments were completed, and the policy on retirements of assets. On the basis of this analysis an estimate is made of the growth of fixed assets. Section III contains an analysis of the productivity of fixed assets, based on the data on fixed assets together with estimates of net industrial production, and also an examination of the main factors that affect the productivity of assets -- changes in the distribution of fixed assets by branch, technological development, the degree of excess capacity, the supply of labor and materials, and the efficiency of labor and management. This analysis of historical trends is the basis for a general evaluation in Section IV of Czechoslovak investment policy and for a discussion of planned trends in investments, fixed assets, and industrial production.

Czechoslovakia took its first comprehensive inventory of assets in the economy on 1 January 1955. 1/* In the case of industry, an inventory had been taken once before -- on 1 January 1948 -- but it was hastily conducted and lacked a uniform methodology. 2/ Plans for carrying out the inventory of 1955 were made more carefully, so as to insure consistency in the data on the age, condition, technical level, and value of assets.** This inventory served as a pilot operation for the Soviet inventory 4/ conducted 5 years later.*** In both inventories, assets were revalued at replacement cost -- in Czechoslovakia at what it would have cost to replace productive capacity existing in January 1955. Although neither inventory made an explicit allowance for past depreciation of assets, obsolescence was taken into account. The replacement cost of old equipment was determined from data on the current cost of production for equipment of the same general type and productive capacity. Therefore, the cost of replacing assets reflected the technology of 1955, rather than that of the year in which the assets

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** The new inventory showed that the value of industrial assets existing in 1948 had been underestimated by 39 percent. 3/
*** The Soviet census was taken as of 1 January 1960.

were produced. Assets with an expected life of less than one year or which cost less than 600 crowns* were not counted in the inventory. 5/

The Czechoslovak inventory established the value of assets as of 1 January 1955. The value of industrial assets in other years was obtained by adding or deducting the net additions to fixed assets in each year, the net additions being equal to gross capital investments less any increase in unfinished investments and the value of assets retired during the course of the year. Additions to assets were calculated in 1955 prices.

The index of industrial production was obtained by using a large sample of commodity series in physical units, weighted by net output at factor cost.** The estimates of industrial output include handicrafts, as do those for industrial assets.

II. Growth and Distribution of Fixed Assets in 1948-60

A. Industrial Heritage of the Communists

Czechoslovakia has had a long tradition in industry. Mining and the manufacture of textiles, glass, and porcelain are among the country's oldest industries, and in the 19th century there was also a rapid development of metallurgy, machine building, chemicals, leather, and food processing. Long before Czechoslovakia became a nation in 1918, Prague, Pilsen, Brno, Ostrava, and Most were important centers of heavy industry.

Independence and the breaking up of the Austro-Hungarian Empire in 1918 forced Czechoslovakia to seek new foreign markets and to diversify industry further. Consumer industries now had to export a large part of their output in order to make good use of capacity. During the interwar period, more than half of industrial output, mainly consumer goods, was exported. 6/ In general, domestic manufactures were equal in quality to those produced in the advanced industrial countries of Western Europe, and Czechoslovak goods had a favorable reputation in world markets. Substantial imports of industrial equipment (mostly from Western Europe), however, continued to be necessary, although some expansion occurred in certain branches of heavy industry, such as mining, engineering, steel, and chemicals. Stimulated by military requirements, the expansion of heavy industrial plant was

* Unless otherwise indicated, all crown values are in constant 1957 prices. The official rate of exchange for noncommercial transactions -- 14.3 crowns to US $1 -- is a rough approximation of the purchasing power of the crown in relation to the dollar (for investment goods).
** See Table 5, Appendix A, p. 42, below.

accelerated in the years of recovery from the depression of the early 1930's and during the 6 years of German occupation (1939-45), while, on balance, there was disinvestment in light industry.

Direct war losses were relatively small in Czechoslovakia, but excessive use of equipment and inadequate maintenance during the war led to a considerable amount of replacement and repair of equipment afterwards. In heavy industry, war and war-related losses were more than offset by new investments during the war. Light industry, although probably suffering less war damage than heavy industry, lost a significant part of its skilled labor with the expulsion of some 2 million Sudeten Germans during 1945. Economic reconstruction proceeded rapidly during 1946-47, and by the time of the Communist takeover early in 1948, fixed assets in Czechoslovak industries probably were at least as large as in the late 1930's. The structure of assets had shifted further in favor of heavy industry, so that almost 56 percent of assets were in heavy industry, including 18 percent in machine building. The percentage distribution of industrial fixed assets at the end of 1948 is shown in the tabulation on p. 14.

B. Growth and Distribution of Industrial Investments

Since 1948, when the Communists assumed control of the government, investment policy has been focused unalterably on the rapid expansion of heavy industry. Even during 1953-55, when industrial investments were cut back to permit much greater investments in housing and agriculture than in the past, the share of heavy industry in total industrial investments increased. It is estimated that heavy industry absorbed about 85 percent of total industrial investments in 1948-60. The value of investments by branch of industry during 1948-60 is given in Table 1.*

Within heavy industry, the largest amount of investment was directed to branches producing electric power and basic materials. During 1948-60, investments in power, fuels, metallurgy, chemicals, rubber, and construction materials made up 64 percent of total industrial investments compared with about 21 percent for machine building. Moreover, investments in the power and basic materials branches of industry have constantly increased, even during 1953-55, when investments in machine building and light industry were sharply reduced. The basic industries had to be built up rapidly because, in the absence of far greater foreign trade opportunities, they were the main support for the development of the economy. Iron ore mining, for example, helped to support the expansion of the steel industry, the development of which in turn supported the expansion of machine building. Coal

* Appendix A, p. 36, below.

mining was expanded because coal is the predominant source of energy found in Czechoslovakia. The investment cost of rapidly increasing the output of basic materials and power was high, however, because the basic industries in general are highly capital-intensive,* and many of them were producing at nearly full capacity after 1951.

By nearly any measure (for example, net output, gross output, employment, value of fixed assets), machine building is the largest single branch of Czechoslovak industry.** It has been given the highest priorities in allocation of factors of production and has received larger investments than any other single branch. Relative to the value of net output, however, investments have been lower in machine building than in basic materials because the machine building industries generally are less capital-intensive than nearly all of the basic materials industries. In addition, excess productive capacity was widespread in machine building during the entire period.

Investments in light industry were extremely low by any standard. Except in a few branches that produced goods for heavy industry (for example, certain types of glass, ceramic, and wood products) or that were important to the development of the state storage and distribution network (for example, refrigeration), the regime did very little to increase productive capacity or even to replace worn out or obsolete equipment.

There have been substantial changes both in the rate of growth of industrial investments and in the distribution of investments since 1948. Total industrial investments grew rapidly in 1949-52, stagnated during the "new course" of 1953-55 at a level nearly 15 percent below that of 1952, and then began to rise again in 1956. The sharpest increases in industrial investments in recent years occurred in 1958 (24 percent) and in 1959 (21 percent). (See Table 1.***)

The percentage distribution of investments changed substantially in 1949-52, in 1953-57, and again in 1958-59, reflecting the distinctive economic circumstances of those periods. Although data on the distribution of investments in 1960 are not available, it is estimated that

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* A capital-intensive industry (or product) uses more capital per worker than does industry as a whole.

** For purposes of this report, the machine building branch is also considered as one of three sectors of industry. The other two are light industry (consisting of the wood, paper, glass, porcelain and ceramics, food, textiles, clothing, and leather branches) and basic materials and power (consisting of the electric power, fuel processing, fuel and ore mining, metallurgy, chemicals, rubber, and construction materials branches).

*** Appendix A, p. 36, below.

the distribution was about the same as in 1958-59. Significant shifts in the pattern of investment during 1948-59 can be seen clearly in the following tabulation, which shows the percentages of industrial investment going to machine building, light industry, and basic industry; and within the latter, to fuels and power and to metallurgy.

	1948	1949-52	1953-57	1958-59
Machine building	20	25	18	20
Basic materials and power	57	54	70	66
Of which:				
Fuels and power	32	20	35	34
Metallurgy	10	18	18	16
Light industry	23	21	12	14

Investments in machine building mounted rapidly in 1949-52, because it was necessary to re-tool and convert production to meet the rapid growth in demands for machinery, not only for the domestic investment program but also for the other countries of the Bloc, especially the USSR. These large demands together with Western export controls led to the creation of considerable new productive capacity in the machine building industry and a rapid diversification of machinery output.

During 1953-57, investments in fuels and power more than doubled, an increase occasioned by threatened shortages of fuels and power. Investments in all other branches, however, especially light industry and machine building, were cut back severely, and investments in these two branches in 1957 had not reached the level of 1952. The shares allocated to machine building and light industry declined because the supply of materials to these industries at that time fell far short of the capacity to process materials. Investments in machine building declined to about the level of investments in metallurgy, because the machine building plant had been overexpanded in relation to the supply of metallurgical products. Output in light industry could be expanded without much investment by importing more materials and utilizing existing capacity. The drop of 23 percent in investments in light industry in 1953-57 relative to those in the preceding 5 years shows how the Czechoslovak regime was able to maintain its basic economic orientation at a time when other Soviet Bloc countries were devoting additional resources to production of consumer goods.

In 1958-59 the distribution of investments shifted slightly in favor of the processing industries. Both machine building and light industry picked up two percentage points. In the case of machine building, this shift was induced by the formulation of directives in 1958 on the new Five Year Plan (1961-65) 7/ and by the signing of the Czechoslovak-Soviet agreement on economic cooperation for 1959-65. 8/ A new cycle had started, which required, as in 1949-52, that sufficient capacity first be constructed in machine building to support future investment and export needs.

C. Maturation of Investments and Retirements

Because construction of new plant and equipment took a substantial period of time, particularly in the basic industries, completions lagged well behind new investments. As a result of this lag and the rapid growth of new investment, unfinished investments rose from no more than 2 billion crowns in 1948 to about 14 billion crowns in 1959, about the value of average annual investments since 1955.

Unfinished investments accumulated most rapidly in the early years of the Communist period, reaching more than 10 billion crowns in 1952. When industrial investments declined in 1953-55 and a concerted effort was made to complete old projects, the stock of unfinished investments stabilized. Unfinished investments increased again with the renewed rise of investment spending in 1956 and have fluctuated around this higher level since that time. The following tabulation shows yearly investments and completions and the stock of unfinished investments during 1948-59 (in millions of 1957 crowns):

Year	Investments	Completions	Unfinished Investments*
1948	5,100	3,862	1,230**
1949	6,620	4,429	3,430
1950	7,880	5,453	5,850
1951	9,130	7,100	7,880
1952	11,000	8,596	10,290
1953	9,680	7,167	12,800
1954	9,610	10,883	11,530
1955	9,540	9,088	11,980
1956	11,200	9,543	13,600
1957	12,200	12,293	13,550
1958	15,200	13,970	14,820
1959	18,500	19,830	13,460

* Cumulative investments minus cumulative completions. (See the statement on rounding, p. 35, below.)

** This number assumes that the stock of unfinished investments at the end of 1947 was zero. It probably was no greater than 1 billion crowns so that unfinished investments at the end of 1948 would be about 2 billion crowns and at the end of 1959 would be 14.5 billion crowns as a maximum.

On the average during 1948-59, the lag between the initiation and the completion of investments was 1 to 2 years. In the case of new plants the lag was, of course, much larger than 2 years. One project -- the steel plant in Kuncice -- has been under construction for 11 years and is not finished yet, although parts of it have been in operation since 1952 and additional facilities were subsequently brought into operation. Such phasing of operations is typical of many integrated investment projects. Many investments, however, involved an expansion of productive capacity in old plants, and this could sometimes be done in a few months.

The existence of a lag explains the considerable difference between the trends in investments and completions. When investments were falling during 1953-54, for example, completions continued to increase. There is every indication, however, that the average lag declined from around 2 years during 1948-50 to approximately 1 year during 1957-59. Although industrial investment rose about as rapidly in 1956-59 as in 1949-52, the volume of unfinished investments increased much more slowly in the latter period and actually declined in 1959, when investments grew by 21 percent.

The lag was shortened in spite of changes in the structure of investments. After 1953 a larger share went to power and coal mining, where investments mature slowly. In addition, construction work increased from 45 percent of total industrial investments in 1949-52 to 49 percent in 1956-59. Both of these factors should have tended to lengthen the construction period. The shortening of the lag, therefore, probably resulted from greater efficiency in construction, which in turn arose from increased experience in industrial construction and, since 1958, from organizational changes that improved the control of large investment projects.

The regime's policy regarding the retirement of old equipment also affected the growth of fixed assets. During 1949-57, assets were retired at very low rates. Since 1958, however, the retirement rate (the percent of fixed assets retired per year) has more than doubled because the planners have changed their views on obsolescence and have begun a program of modernizing certain industrial facilities (see Table 2*). By postponing the replacement of obsolete equipment, the Communist regime formerly had hoped to promote the growth of assets in key industries, making up for the low efficiency of the obsolescent facilities by increasing the supply of labor and materials. But the policy of low retirement led to higher expenditures for capital repairs than would have been required otherwise. Such expenditures,

* Appendix A, p. 38, below.

which are not included in the figures on investments in this report, were almost one-fifth as large as the indicated investments in 1949-59.

Low retirement of equipment had an especially unfavorable impact on the assets in light industry. In 1960 only 33 percent of these assets were less than 12 years old, compared with 61 percent in machine building and 70 percent in power and basic materials. A large part of the equipment in light industry was more than 40 years old, because this sector had received little investment in the inter-war period or in the war and reconstruction years. Even among the branches of heavy industry, there is considerable variation in the age of assets. The following tabulation shows assets under 12 years old as a percent* of total assets of selected industries in 1960:

Chemicals	86	Machine building	61
Metallurgy and ore mining	72	All industry	58
Construction materials	71	Rubber	55
Electric power	70	Fuel processing	48
Fuel mining	66	Light industry	33

D. Trends in the Growth of Fixed Assets

The fixed assets of Czechoslovak industry, including handicrafts, grew by 96 percent in 1949-60, or from an estimated 114 billion crowns** in 1948 to 223 billion crowns in 1960 (see Table 2***). The most rapid growth occurred in the power and basic materials branches.

* These percentages were derived by dividing gross additions to assets in 1949-60 by the value of assets in 1960.

** These values were derived from published statistics on the value of annual gross additions to industrial assets, indexes of the growth of industrial assets, retirement rates of productive assets in the economy, and the percentage distribution of assets by industrial branch at the end of 1957. The asset values shown in Tables 2 and 3 (Appendix A, pp. 38 and 40, respectively, below) are undepreciated, expressing what it would have cost to replace the productive capacity of existing assets in the various years in 1957 prices. Gross additions to assets and the distribution of assets in 1957 are from data in 1957 prices, but the index of growth of assets is based on data in 1955 prices. Series on industrial investments in both 1955 and 1957 prices, however, are nearly identical, indicating that there was hardly any change in wholesale prices between these years.

*** Appendix A, p. 38, below.

The following tabulation shows the percentage increases in the assets of selected basic industries during 1949-60:

Basic materials and power	174
Chemicals and rubber	398
Metallurgy and ore mining	193
Construction materials	188
Electric power	181
Fuel mining	144
Fuel processing	60

Assets in machine building, the largest branch of industry, grew by 110 percent, while light industrial assets grew by only 23 percent. The values of fixed assets in the major branches of industry during 1948-60 are shown in Table 3.*

The principal changes in the percentage composition of industrial assets are shown in the tabulation below. The basic materials and power industries accounted for an increasing percentage of total industrial fixed assets, and assets in light industry declined sharply in relative size.

	1948	1954	1956	1960
Machine building	18.2	20.2	19.9	19.5
Basic materials and power	38.2	44.8	47.8	53.2
Fuel mining	8.6	9.0	9.5	10.7
Metallurgy and ore mining	9.3	11.9	12.4	13.8
Electric power	8.3	9.9	10.8	11.9
Other basic materials**	12.0	14.0	15.1	16.8
Light industry	43.6	35.0	32.3	27.3
Foods	14.9	12.3	11.6	9.7
Textiles	13.0	10.5	9.6	7.9
Other light industry***	10.5	9.9	9.2	8.3
Miscellaneous and statistical discrepancy†	5.2	2.3	1.9	1.4

* Appendix A, p. 40, below.

** Including chemicals, rubber, fuel processing, and construction materials.

*** Including clothing, leather, wood, paper, glass, porcelain, and ceramics.

† Including printing, fats, soaps, perfumes, refrigeration plants, and possibly private handicrafts (see the methodology to Table 3).

III. Productivity of Fixed Assets in Industry, 1949-60

A. Trends in the Productivity of Fixed Assets

Increases in the stock of fixed assets have played a most important role in the industrial growth of Czechoslovakia under the Communists. The industrial branches which received large increases in their fixed assets generally achieved large increases in output in 1949-60. The relation between the percentage increases in output and those in fixed assets, however, differs considerably among branches. The following tabulation compares the percentage increases in output and in fixed assets of selected branches of industry from 1948 to 1960:

	Output	Fixed Assets
All industry	155	96
Light industry	70	23
Machine building	257	110
Basic materials and power	195	174
Chemicals and rubber	301	398
Electric power	225	181
Fuel processing	219	60
Construction materials	202	188
Metallurgy and ore mining	201	193
Fuel mining	138	144

As indicated above, net industrial production increased faster than fixed assets in industry as a whole, as well as in each of the three main industrial sectors -- machine building, basic materials and power, and light industry -- thus the productivity of assets (the ratio of net output to the value of assets) increased. The productivity of fixed assets conventionally is represented by its reciprocal, the "average capital-output ratio" (ACOR). In industry as a whole the ACOR declined from 3.84 in 1948 to 2.96 in 1960.

The ACOR for all industry conceals many differences in the ACOR's among the industrial branches. ACOR's are much higher in capital-intensive branches, such as power, fuel processing, chemicals, mining, metallurgy, paper, and foods, than in labor-intensive branches such as machine building, textiles, leather, and woodworking (see Table 6*). There also

* Appendix A, p. 43, below.

has been considerable variation among branches in the movement of ACOR's during the period, although in most of them the trend has been downward.

An examination of the ACOR's by branch of industry in Table 6* reveals three basic tendencies. First, over the period as a whole, ACOR's declined substantially only in branches engaged primarily in the advanced stages of processing or in the refining of basic materials. The largest declines took place in machine building and in fuel processing (coke ovens, gas works, petroleum refineries); declines also occurred in light industry, in the rubber industry, and in electric power stations. Among the industries engaged mostly in mining and the early stages of processing, however, there was only a small decline in ACOR's. Second, for these basic industries except construction materials, the entire decline in ACOR's took place in the early years. In industry as a whole, the ACOR declined by the same percentage over the 9 years from 1952 to 1960 as during the 3 years from 1948 to 1951. Third, the movement of ACOR's follows a definitely cyclical pattern, which was much more pronounced during the first half than during the last half of the period. ACOR's declined in industry as a whole and in all branches except chemicals and construction materials between 1948 and 1951; they increased slightly in all industry and also rose or were stable in all branches except fuel processing and construction materials between 1951 and 1954; then they declined again in industry as a whole and in all branches except electric power and fuel mining between 1954 and 1957. Between 1957 and 1960 the decline continued, but at a reduced pace, in total industry and in all branches except mining, rubber, construction materials, and metallurgy. The following tabulation presents average capital-output ratios for the major branches of industry in selected years of the 1948-60 period.

	1948	1951	1954	1957	1960
Total industry	3.84	3.37	3.48	3.13	2.96
Machine building	2.91	2.37	2.43	1.98	1.71
Basic materials and power	4.55	4.33	4.33	4.16	4.22
Electric power	8.22	7.07	7.22	7.60	7.11
Fuel processing	9.96	7.26	5.86	5.26	4.98
Fuel mining	3.14	3.03	3.06	3.09	3.21
Metallurgy and ore mining	4.31	4.03	4.14	3.98	4.18
Chemicals	3.29	4.32	5.23	4.50	4.30
Rubber	3.26	2.54	2.60	2.29	2.44
Construction	3.28	3.57	3.15	2.76	3.13
Light industry	3.84	3.32	3.47	3.05	2.79
Foods	4.82	4.17	4.34	3.95	3.89
Textiles, clothing, and leather	3.14	2.89	3.20	2.73	2.35
Glass, porcelain, and ceramics	3.53	3.48	3.49	2.72	2.51
Wood and paper	2.63	2.44	2.44	2.42	2.30

* Appendix A, p. 43, below.

This cycle coincides roughly with the cycle of investment completions and the consequent changes in the rate of growth of fixed assets. When completions were relatively low, as in 1949-51 because of low investments in the early years, and again as in 1955-57 because of a decline in investments during 1953-55, the ACOR's declined sharply. During the other two periods (1952-54 and 1958-60), when there was a large increase in completions, ACOR's rose, stabilized, or fell relatively slowly. An even more important factor in the cyclical movement of ACOR's during the first three periods (through 1957), however, is the sharp fluctuation in the rate of growth of output in machine building and light industry. The rise in the over-all ACOR during 1952-54 and the fall during 1955-57 are wholly attributable, respectively, to a sharp decline followed by an even greater increase in the rate of growth of output in machine building and the foods, textiles, clothing, and leather industries (see Table 5*).

B. Factors Affecting the Productivity of Fixed Assets

1. General

The many factors that determine the productivity of fixed assets can be classified under three headings: the degree of utilization of capacity, the composition of assets, and technological and environmental conditions. All the factors, however, are closely interrelated, and most of them do not lend themselves to statistical analysis.

Increased utilization of productive capacity tends to lower capital-output ratios. Productive capacity may be idle at certain times because of inadequate demand, in which case production can be raised without investments by increasing employment or supplies of materials, or both. In other cases, greater utilization of capacity requires selective investments to remove bottlenecks to production, but these investments often are small in relation to the gain in output. On the other hand, the capacity of new plants may not be used effectively for a time, because complementary facilities are not finished as a result of unexpected delays or bad planning. Moreover, both new plants and new equipment in old plants may be operated inefficiently until adequate experience has been gained. Workers may have to develop new skills, and management also requires experience in finding the best method of organizing operations. As new plants achieve a more efficient utilization of capacity, capital-output ratios decline, but whether they will be higher or lower than in old plants will depend primarily on the type of technology that they incorporate.

* Appendix A, p. 42, below.

Changes in the composition of assets between capital-intensive and labor-intensive branches can also affect the aggregate capital-output ratio. If assets in industries such as electric power, fuel processing, mining, and metallurgy, which have relatively high capital-output ratios, are growing more rapidly than those in labor-intensive industries, the aggregate capital-output ratio tends to rise.

Technological innovations and changes in production techniques generally may bring about a substitution of capital for labor, which tends to raise capital-output ratios. But these innovations may also reduce the necessary value of capital per unit of output through savings in the use of materials, improved quality of output, or simply increased efficiency of equipment. A good example of a capital-saving innovation now being undertaken in Czechoslovakia, the US, and a number of other countries is the conversion to the oxygen process in making steel.

Environmental conditions are especially important in mining, where the accessibility and quality of the product may change. Environmental conditions may also have a significant impact on capital-output ratios in other industries, when the quality of the materials available to them changes substantially.

In Czechoslovakia, capital-output ratios declined in spite of the facts that the industrial structure was becoming more capital-intensive, that conditions in mining were becoming more difficult, and that technological development was not particularly rapid. This decline was mainly a result of increased utilization of capacity in the processing and refining branches -- particularly in machine building, light industry, fuel processing, and electric power.

2. Changes in the Composition of Fixed Assets

On the whole, the industrial investment program of Czechoslovakia favored the capital-intensive branches (especially metallurgy, electric power, and chemicals), which consequently received the largest percentage increases in fixed assets. Basic materials and power, paper, and foods had about 55 percent of total assets in 1948, about 60 percent of the total in 1954, and 65 percent of the total in 1960. This change in the branch structure of assets, however, has only a small effect on the ACOR for all industry -- it raises the ACOR by only 2 percent between 1948 and 1960.

Too little is known about the distribution of assets within major branches to draw firm conclusions as to the over-all effect of structural changes on the productivity of capital. In construction

materials, a large share of investments of the early years probably was concentrated in cement plants, which are capital-intensive. In the leather and shoe industry, on the other hand, most investments probably went to shoe plants, which are relatively labor-intensive. But it is impossible to determine whether or not such structural changes within the branches tended to offset each other, or even whether their effect could have offset the effect of the structural change on the branch level. Nevertheless, structural changes clearly offer no explanation for the decline in the ACOR over the period; they may even have tended to raise it.

3. Changes in Technology and Environment

The rate of technological change in Czechoslovakia probably was not particularly rapid during the period under construction. Czechoslovak writers often complain of the low technological level of domestic plants in comparison with those of Western Europe and the USSR. Until recently, the writers admit, plant managers have been insufficiently interested in new technology. Being concerned primarily with fulfilling the gross production plans, they were often unwilling to take the risks involved in making technological improvements. Enterprise plans usually could be fulfilled by adding more labor or by purchasing more materials.

However, the introduction of new technology in Czechoslovak industry during the postwar period contributed to industrial growth in a number of ways: it led to savings of manpower, to some small savings in the consumption of materials, and probably to a reduction in real investment costs per unit of productive capacity. Moreover, it greatly facilitated a more efficient utilization of existing capacity by permitting a fuller use of floorspace in industrial plants and the breaking of bottlenecks in the production process. The considerable increase in the value of machinery and equipment per unit of total fixed assets,* for example, probably indicates both a better utilization of capacity and improved technology. Apart from their effects on the use of capacity, however, technological improvements do not appear to explain the observed decline in capital-output ratios.

In the first place, reductions in real costs per unit of capacity from prewar to postwar years have been taken into account at least partly in official statistics on fixed assets, because they were valued at replacement cost in the 1955 census. If the effect of cost reductions had not been taken into account, prewar assets would have been assigned a higher value, assets would have increased more slowly

* The value of assets in industrial machinery and equipment is given in Table 4, Appendix A, p. 41, below.

during the period, and the ACOR's would have fallen more rapidly. In the second place, technological advances which involve the substitution of capital for labor would increase rather than reduce capital-output ratios.

In some industries the favorable effect of new technology did not compensate for the unfavorable effect on capital-output ratios of worsening environmental conditions. The tendency for the ACOR to rise in coal mining, for example, probably is partly a result of the necessity to develop deeper seams. In ore mining, the capital-output ratio increased rapidly throughout 1949-60,* presumably because the ore was becoming less accessible and required an increased degree of preparation because of its declining quality. When Czechoslovakia reduced imports of high grade iron ores from the West and substituted the relatively inferior Soviet and domestic ores, beneficiating facilities had to be built. Similarly, the substitution of Soviet cotton for long-fiber Egyptian cotton must have affected the productivity of assets in the textile industry.

4. Changes in the Utilization of Capacity

The principal factors affecting the utilization of production capacity in Czechoslovak industry were the supply of materials and labor and the efficiency of operation in new plants during the period immediately following their completion. The relative importance of these factors differs considerably in the individual branches of industry. In extractive industries, changes in the utilization of capacity were mainly a result of the supply of labor. In the very capital-intensive fuel processing and electric power branches, the supply of materials was the principal determinant of the utilization of capacity. In most of the other basic materials branches, metallurgy, chemicals, rubber, and construction materials, the supply of materials and labor played a role, especially during 1949-51, when the old plants still were not fully utilized, but the efficiency of new plants was more important during the rest of the 1949-60 period. Finally, in machine building and light industry, changes in the use of capacity can be traced mainly to changes in inputs of both materials and labor (see Table 11**).

There are many indications that the lag between the completion of a plant and its efficient utilization was substantial in Czechoslovakia, averaging perhaps 2 to 3 years in the basic materials

* The capital-output ratio of ore mining is estimated to have risen by 85 percent between 1949 and 1957.
** Appendix A, p. 48, below.

branches. As a result of this lag, in periods when completions increased substantially there was a tendency for new excess capacity to be created faster than the old capacity was being absorbed.

In blast furnaces and open hearth furnaces there was a definite upward trend in the degree of utilization of productive capacity as a result of technological improvements. But the use of capacity increased rapidly when little or no new capacity was being added (during 1955-57) and increased less rapidly, or even decreased, when there were large additions to capacity (during 1952-54 and 1958-60). The following tabulation shows percentage changes in the index of capacity utilization* in the iron and steel industry:

Years	Blast Furnaces	Open Hearth Furnaces
1952-54	-5	+7
1955-57	+23	+21
1958-60	+9	+6**

Fluctuations in the coefficients of utilization probably were caused not only by the incidence of repairs and the rate of introduction of new technology, but also by structural imbalances among facilities in new plants which persisted for a period of time and resulted in a poor coordination of supplies.

Direct measures of the utilization of capacity are not available for other basic materials branches, but it seems likely that the close correlation between changes in the rate of completions and changes in capital-output ratios, noted in Section A ,*** is a result of the lag in the utilization of capacity in new plants. This lag, moreover, probably is more a reflection of structural imbalances in productive capacity in new plants and of the difficulty of mastering new processes and techniques, than of general shortages of materials or labor.

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* The coefficient of utilization of blast furnaces is the number of cubic meters of effective blast furnace volume required to produce 1 metric ton of pig iron in 24 hours. The coefficient of utilization of open hearth furnaces is the number of tons of steel produced per square meter of furnace hearth in 24 hours.

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[redacted]

** 1958-59 only.

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*** P. 17, above.

Fuel processing is the only basic materials branch in which ACOR's registered an almost steady decline, mainly because there was no appreciable expansion in assets until about 1956. Most of the output came from refineries built before World War II and was based on rising imports of crude oil. Some of the big investments of the recent years have gone toward the construction of the Slovnaft refinery at Bratislava, the first section of which began operating in July 1957. The recent expansion of capacity in this refinery has already given rise to large increases in output, but the ACOR in fuel processing has tended to stabilize.

In electric power stations, output grew much faster than capacity until 1954. Since 1954, however, percentage increases in fixed assets and installed capacity have more nearly matched the increases in output, as shown in the following tabulation:

Period*	Production	Installed Capacity**	Fixed Assets
1949-51	37	10	18
1952-54	32	20	35
1955-57	30	29	37
1958-59	23	20	17

Capital-output ratios in coal mining would have increased considerably if output had not been increased at a forced rate in old mines, through the use of labor brigades and overtime work.

Changes in the utilization of capacity through changes in the supply of materials and labor are clearly responsible for the fluctuations in ACOR's in machine building and light industry. Machine building had its greatest decline in ACOR's in 1949-51, when supplies of steel and manpower increased most rapidly; ACOR's rose in 1952-54 and declined less rapidly in 1958-60 than in 1955-57 because the growth of labor and steel inputs slowed down, as shown by the following percentage increases:

Period*	Employment	Apparent Consumption of Steel
1949-51	24	42
1952-54	20	20
1955-57	12	38
1958-59	9	18

* Base years for calculation of percentage increases are 1948, 1951, 1954, and 1957.

** 11/

That the slower growth of output in machine building in 1952-54 reflects a change in supply of materials rather than in demand is known from official statements. Had investments continued at the same rate during 1952-54 as during 1949-51, ACOR's would have risen much more. The relatively small decline in ACOR's in 1958-59, however, may have been a result not only of a reduced rate of growth in the supply of steel, but also of inefficient operation in the many new facilities added in this period. Changes in design of machines during this period were bringing about some savings in steel inputs, so that an increase in steel supplies smaller than that during 1955-57 was needed to maintain a nearly constant rate of growth in output of machinery.

In light industry, increases in productive capacity were very small during the entire 1949-60 period; thus changes in ACOR's depended on the utilization of capacity in old plants. ACOR's declined during 1949-51 in all branches of light industry as a result of increased inputs of labor and materials. Thereafter, increasing resources had to be diverted from light industry to serve the growing requirements of heavy industry. Because of a tight labor supply in Czechoslovakia, workers were transferred from light industry to heavy industry, and in some branches the drop in employment was especially severe. The textile, clothing, and leather industries had a smaller employment in 1959 than in 1948. Moreover, imports of raw materials for light industry were slashed so that the requirements of heavy industry could be met. In the early years, an improvement in the terms of foreign trade permitted the country to supply both light and heavy industry. But the terms of trade began to worsen after 1950, just when requirements for raw materials for heavy industry were sharply rising. The resulting strain in the balance of payments was relieved partly by reducing imports of light industrial materials. These cutbacks led to a reduction in the volume of light industrial output and in rising ACOR's. On the other hand, the decline in ACOR's after 1954 is attributable to increases in employment and rising imports,* which are shown in the following tabulations:

Employment in Textiles, Clothing, and Leather (1951 = 100)	
1954	90
1957	100
1959	107

	Imports of Materials**	
	1957 (1954 = 100)	1959 (1957 = 100)
Cotton	128	127
Wool	175	114
Cowhides	183	182
Jute	125	130

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* Although the terms of trade did not improve until 1958, they did not worsen by very much between 1954 and 1957.

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Capacity was also better utilized in 1955-60 than in 1952-54 in the food industry, thanks to imports that partly compensated for poor domestic harvests.

IV. Evaluation and Prospects

A. Evaluation

The Czechoslovak investment program of 1949-60 is undoubtedly considered by the regime to have been a great success. Industrial output grew rapidly over the period, and while the growth in light industry probably did not come up to the expectations of the regime, at least the major official objective -- the substantial building up of heavy industry -- was achieved. Plans for total industrial output generally were underfulfilled through 1953, but they have been achieved or overfulfilled since then.

In comparison with other countries of Western Europe, Czechoslovak industry has improved its relative position in recent years. The rate of industrial growth has increased in Czechoslovakia, while it has declined in most Western European countries.* In 1951-55 the Czechoslovak rate was slightly below the average for countries in the Organization for European Economic Cooperation (OEEC). During 1956-60, industrial production increased faster in Czechoslovakia than in any Western European country, as shown in the following tabulation of average annual increases:

	1951-60	1951-55	1956-60
Czechoslovakia	7.6	6.2	9.1
Austria	7.0	9.2	4.9
France	6.4	5.5	7.3
Italy	8.9	8.9	8.9
United Kingdom	3.3	3.9	2.7
West Germany	9.6	12.3	7.0
OEEC countries	6.1	6.7	5.4

There are indications, however, that industrial growth was more costly in Czechoslovakia than in Western Europe, in terms of both labor and capital inputs. The Western European countries listed above achieved their gains in output with significantly smaller increases in employment than in Czechoslovakia, although Czechoslovak

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labor productivity, which lagged behind that in most of Western Europe during the early years, grew at one of the highest rates in Europe thereafter (see Table 10*). Czechoslovak industrial investments at factor cost absorbed about 14 percent of GNP in 1952-58. By contrast, such countries as the UK, France, West Germany, Italy, and Austria, most of which are more industrialized than Czechoslovakia, devoted only about 7 to 9 percent of their respective GNP's to industrial investments in 1952-58 (see Tables 8 and 9**). Because differences in relative costs among these countries probably are partly responsible for the differences in the ratios of investment to GNP, no firm conclusions can be drawn concerning the relative productivity of capital in Czechoslovakia and in Western Europe. But it seems clear that the investment effort applied to increasing industrial output was greater in Czechoslovakia.

An important factor in the differences in the investment effort was the role of foreign trade. In the early years, outside assistance stimulated industrial growth in many Western European countries, while Czechoslovakia not only had to develop industry from its own resources, but also extended some credits to less developed countries of the Bloc. Moreover, the foreign trade opportunities of Czechoslovakia were more limited than those of Western European countries, which had full access to the world market. Because of orienting its trade toward the Soviet Bloc and reducing dependence on the West for critical materials, Czechoslovakia had to supplement imports with output from domestic industries developed at high marginal costs.

The high cost of the Czechoslovak industrial investment program was felt in other sectors. Agricultural output stagnated throughout the 1950's, holding down the growth in the GNP. Compared with industry's average annual rate of growth of 7.6 percent, the GNP grew by only 4.2 percent. The rate of growth of GNP of Czechoslovakia was about the same as the average for all OEEC countries and considerably less than in most countries of continental Western Europe.

B. Plans for Industrial Growth in 1961-65

According to the plan for 1961-65, 17/ production in all Czechoslovak industry and in the three main industrial sectors will grow at almost the same rate as was achieved in 1956-60, as shown by the following indexes of industrial production:

* Appendix A, p. 47, below.
** Appendix A, pp. 45 and 46, respectively, below.

	1960* (1955 = 100)	1965* (1960 = 100)
Total industry	155	158
Machine building	172	176
Basic materials and power	162	168
Light industry	131	126

In order to achieve these goals, existing industrial facilities are to be modernized and many new plants incorporating a high level of technology are to be built. Investments are scheduled to be 88 percent higher in 1961-65 than in 1956-60. 18/ About the same share of total industrial investments is to be allocated to machine building, but the share going to light industry will fall and that of basic materials and power will rise, as shown in the following tabulation:

	Percent of Total Industrial Investments	
	1956-60	1961-65
Machine building	19	19
Light industry	14	8
Basic materials and power	67	73

The increase in the share of investments in the basic materials branches is attributable to investments in the metallurgical, chemicals, rubber, and fuels processing branches, which together are scheduled during 1961-65 to grow by 130 percent over the level of 1956-60,** constituting a little more than one-half of investments in basic materials. Planned investments would permit fixed assets in industry to grow faster than

* Calculated indexes. The official index of gross industrial production planned for 1965 is 156.

** Investments to be carried out by the Ministry of Chemicals and the Ministry of Metallurgy and Ore Mines are to increase by 145 and 115 percent, respectively. The Ministry of Chemicals includes the chemicals and rubber branches and part of fuel processing (that is, petroleum refining). The Ministry of Metallurgy and Ore Mines includes the ferrous and nonferrous metals branches and most of the rest of fuel processing.

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in any period since 1948 -- by nearly 8 percent per year -- in spite of a substantially higher rate of retirements and a large probable increase in unfinished investments.

Investment costs per unit of increase in output are planned to be significantly larger than during the past 5 years. According to the plan, investments per unit of additional output will be 3.3 crowns during 1961-65 compared with 2.9 crowns during 1956-60 and 3.9 crowns during 1951-55. But the plan also provides for a faster increase of output than of fixed assets (58 and 46 percent, respectively), which implies a further decline in the ACOR. In industry as a whole, the increase in fixed assets per crown of additional output would be about the same in 1961-65 as in 1956-60 (2.4 crowns compared with 2.3 crowns). It is estimated that investment costs per additional unit of output will be higher in 1961-65 than they were in 1956-60 in most of the basic materials branches and in light industry but will remain about constant in machine building.

In many respects the new plan continues trends observed in 1958-60: an increasing rate of retirements; a growing share of investments allocated to chemicals, fuel processing, and metallurgy; and finally a tendency for the total ACOR's to decline more slowly and for the ACOR in basic materials to stabilize. In industry as a whole, the ACOR would fall only slightly less than it did in 1956-60 -- by 8 percent in 1961-65 compared with 10 percent in 1956-60, and at about the same rate as in 1958-60. And although the higher share of investments in the basic materials branches tends to increase the overall ACOR, by making the structure of industrial assets more capital-intensive, the degree of change in branch structure is no greater than it has been in the past.

There are two main reasons for the planned increase in investment costs per unit of additional output. One is the need to modernize equipment, which is reflected in high retirements; and the other is the rapid increase in outlays for the construction of new plants in capital-intensive branches, which tends to increase the volume of unfinished investments. The difference between officially planned investments and officially planned increments in fixed assets is sufficient to allow about a doubling in the stock of unfinished investments (an increase of about 11 billion to 12 billion crowns) and a large increase in retirements. These trends are reflected in the following tabulations:

	Million 1957 Crowns*	
	1956-60	1961-65**
Additions to assets	62,890	103,200
Retirements	13,200	30,900
Additions to unfinished investments	1,620	11,950
Total investments	77,700	146,000

	Percentages	
	1956-60	1961-65**
Growth of assets (annual average)	6.9	7.9
Rate of retirements (average)	1.4	2.4
Stock of unfinished investments in 1960 and 1965 as percent of investments during the respective 5-year periods	17.5	17.5

Thus, more than 21 percent of total industrial investments can be used to replace old equipment and structures during 1961-65, compared with about 17 percent during 1956-60. If assets continued to be retired at the same rate as in the past 5 years, instead of at the planned higher rates, fixed assets would increase during 1961-65 by 51 percent -- only slightly less than industrial production.

Expenditures on facilities that will not be completed during the plan period are mainly responsible for the rise in investment costs per added unit of output in the basic materials and power branches, and retirements are expected to be largest in machine building and light industry, although they will probably increase rapidly in all branches.

The substantial increase that appears to be planned for retirements is one reflection of a different approach to investments in old

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* See the statement on rounding, p. 35, below.

** This model is based on (1) the planned growth of assets and (2) the allocation of the remaining investments between retirements and additions to unfinished investments on the assumption that the stock of incomplete investments in 1965 will be the same percentage of 1961-65 investments as the stock existing in 1960 was of 1956-60 investments (17.5 percent).

plants. Until about 1958, investments in old plants were often made on a selective basis to relieve bottlenecks in production and thereby increase the utilization of existing capacity. Now they apparently will be made on a much broader basis because of the progressive deterioration of old equipment and the previous absorption of the most easily exploited reserves of unused capacity. The need to replace prewar equipment is becoming more pressing, not only because it is obsolete but also because it is often worn out or in poor condition.

The planned increase in the share of machinery in industrial investments from 51 percent in 1960 to 57 percent in 1965 is another reflection of the modernization program. 19/ More productive machines are to be installed in order to use factory floorspace more efficiently, and the machines themselves are to be used more intensively by further extending the use of second and third shifts. Through automation and by introducing continuous production processes and improved control devices, it is planned to reduce labor requirements and at the same time to increase the utilization of existing capacity.

In the case of machine building, the regime clearly expects to raise the efficiency of fixed assets substantially by accelerating the rate of technological change and improving the organization of work. Investment costs per added unit of output are planned to be about the same in 1961-65 as in 1956-60, indicating that increased efficiency of assets would compensate for a higher rate of retirements. In light industry, investment costs will be only a little higher in 1961-65 than in the preceding period. ACOR's will continue to decline in both sectors. In percentage terms, however, the decline in ACOR's probably will be smaller than in the past 5 years because of the increasing necessity to substitute capital for labor. The rate of growth of total industrial employment is expected to be significantly lower during 1961-65 than it was during 1956-60 (see Table 12*).

In the basic materials and power branches, new technology will be introduced mainly in new plants and in the expansion of existing industrial complexes. But investments will also be made to modernize existing facilities. Some of the new technology will be of a capital-saving nature, such as the planned introduction of oxygen converters in open hearth furnaces and large turbines in electric power stations, which reduces the cost of materials per unit of output and results in higher output per unit of fixed assets. The increased emphasis on new plants in certain branches, however, is expected to increase considerably the amount of unfinished investments, and the introduction of more capital-intensive production processes will tend to reduce output per unit of fixed assets. On balance the regime appears to be

* Appendix A, p. 49, below.

planning for higher investments per unit of additional output and for little change in the average ACOR for the basic materials branches.

Fuels, metallurgy, and rubber appear to be the areas in which extra output will be most costly to achieve. Construction of 16 new coal mines is to get underway, in addition to which several coal finishing and grading plants are to be built. Although coal will continue to be the main source of energy in the future, a larger proportion of energy requirements will be met from the use of other fuels, such as crude oil and natural gas. This shift to petroleum requires large investment outlays, for capacity in petroleum refineries must be expanded and a pipeline constructed to import oil from the USSR. The building of an integrated steel plant in Slovakia, which probably will not be fully completed until after 1965, and a program of modernizing major steel facilities accounts for the added costs in metallurgy. Finally, the building of two new plants for production of synthetic rubber probably will result in higher investment costs to the rubber industry in this plan period.

The plan appears to call for a rise in ACOR's in fuel mining and possibly construction materials, a stabilization in power and metallurgy, but a fall in chemicals, rubber, and fuel processing. These trends in ACOR's would differ very little from those of 1958-60. In the case of fuel processing, chemicals, and rubber, however, official projections of the relation of fixed assets to output appear to assume that newly created capacity will be utilized very rapidly and that a great deal of capital-saving technology will be introduced. Since the completion of the first stage of the Slovnaft refinery in Bratislava in 1957, ACOR's have in fact been declining in fuel processing. But whether the much larger refining capacity to be completed during the next few years can be used efficiently by 1965 remains to be seen. Similar problems of utilizing new capacity may develop in the projected synthetic rubber plants. In chemicals, an imbalance between capacity and output could arise if key plants are not completed on time or if difficulties are encountered in mastering new technological processes.

It appears clear that the fulfillment of the output goals for 1965 will depend to a greater extent than ever before on investments. They will also depend more than in the past on new technology. For while some increase in investment cost per unit of additional output is provided for in the plan, the actual increase could be even greater if there are difficulties in introducing new technology. It is unlikely, of course, that all of the possible improvements in technology have been incorporated into the plan. Thus there may be a potential technological reserve which could be used to reduce investment costs. But the problem is less one of finding new techniques than of putting them into effect in a relatively short period of time. The increased

attention given to technology during the past few years, as well as the reform of the system of incentives, has not yet had much impact. Technology is not an area in which Czechoslovakia has excelled since World War II, and it remains to be seen how rapidly the rate of technological change can be increased.

There will also be difficulties in the construction of new plants, particularly in areas, such as organic chemicals, where Czechoslovakia has limited experience and is even seeking technical support from Western countries. But the evidence of the past few years and the measures that the regime is currently taking appear to point to a continued over-all improvement in the efficiency of new plant construction. Although small investments have for the most part been decentralized, new plant construction is being more closely supervised than ever by the central authorities. Through better planning and tighter supervision, the regime hopes to follow the planned construction schedules more closely and to reduce by nearly a third the average construction period for centralized investment projects. 20/ There may also be some improvement in the rate at which new plants are brought to full-scale production.

Another favorable aspect of the present Five Year Plan is the stability of economic policy in recent years. Since 1956, industrial investments have increased rapidly, and most of the facilities that will be important to achieving the future goals in output were begun during 1956-60. Thus additions to productive capacity are likely to be spread more evenly than before and the problems brought about formerly by sharp cyclical changes in the additions to capacity probably will be partly avoided.

Future industrial growth in Czechoslovakia will be affected by many factors other than investments. A vital factor, for example, will continue to be the supply of imported raw materials. How well the USSR lives up to its commitments to deliver iron ore and crude petroleum will determine the degree of utilization of Czechoslovakia's rapidly expanding capacity in steel and petroleum refineries. The growth of industrial employment will also be important, and it is partly contingent on the possibilities for releasing labor from agriculture. Finally, changes in economic policy could throw the investment and output plans out of balance.

It is obviously impossible to estimate how effective the Czechoslovak industrial investment program for 1961-65 may be without a complete analysis of prospects for the Czechoslovak economy. Given the other basic assumptions of the Five Year Plan, however, the plan for investments appears to be fairly realistic. The investment costs of achieving the planned increases in industrial output may have been understated, but it is unlikely that this understatement is very large.

APPENDIX A

STATISTICAL TABLES

Czechoslovakia is the only Satellite country to have completed a census of fixed assets in the economy or in the industrial sector. It has published fairly detailed statistics on the growth and branch distribution of industrial assets and on the growth of investments by industrial branch. The absolute value of assets and the branch distribution of investments, however, had to be estimated in this report.

The main building blocks for the estimate of fixed assets and investments presented in Tables 1 through 4 are as follows:

1. The value of total industrial investments in each year
2. The value of investments completed during each year and added to fixed assets
3. The percent of fixed assets retired in certain years
4. Indexes of fixed assets, total and by industrial branch
5. The percentage distribution of fixed assets by industrial branch in some years
6. Indexes of investment by industrial branch

From these data were derived values of fixed assets and investments for each industrial branch and for each year of the 1948-60 period, as well as estimates of unfinished investments and retirements.

The distribution of investments was largely derived from the distribution of fixed assets. It is generally similar to that obtained by using different sources and methods, although there are also significant differences. The advantage of the method used in this report for deriving investments is that it is consistent with the method of calculating fixed assets. Moreover, the results of the alternative methods are not fully consistent either internally or with other published statistics.*

The data and statements on investments and fixed assets in the Third Five Year Plan (1961-65) are for the most part rough estimates based on meager information. Published plans include hard figures only on the growth of total industrial investments 21/ and assets, 22/ on assets in machine building, 23/ and on investments to be carried out by the Ministry of Chemicals and the Ministry of Metallurgy and Ore Mines, 24/ and in all the basic materials branches combined. 25/ Information on plans for production, new plants, modernization and productive capacity, however, was used to gain further insights into plans for investments and fixed assets.

* As for example, Turcan, Socialisticka industrializacia Slovenska (Socialist industrialization of Slovakia), Bratislava, 1960

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The index of net industrial production (Table 5) is roughly comparable methodologically to official indexes of industrial production in Western countries. It differs very little in most years from the official Czechoslovak index of net production, whose method of calculation is not known, but it gives a significantly lower measure of industrial growth in past years than the official Czechoslovak index of gross production. Thus it appears that the official Czechoslovak index of gross production overstates the increase in industrial production. Such a discrepancy does not exist, however, for planned production. The calculated index for 1965, based on official commodity data, is very nearly the same as the official gross production index planned for 1965.

The index of net industrial output for 1948-58 was obtained from the Columbia University project on national income in Eastern Europe. 26/ It was based originally on the Doctoral Dissertation of George Staller at Cornell University. 27/ The index was revised slightly for the purposes of this report; it was also updated to cover 1958-60 and projected to 1965, using the same methodology and, as nearly as possible, the same types of data.

The index was calculated from a large sample of commodity series, nearly all of which are expressed in physical units. Using primarily 1947 and 1948 Czechoslovak wholesale prices as weights for the commodity series, indexes were obtained for 70 industrial groups. Group indexes were then aggregated into indexes for 17 industries using 1948 labor costs as weights. To calculate the index for all industry, the indexes for individual industries were weighted with estimated net output in 1956. Thus, although the base year for the index is 1956, the weighting system is mixed. Mixed weights had to be used because of the insufficient detail of labor cost data and the absence of price data for 1956.

Net output weights for 1956 are a composite of estimated returns to labor and to other factors of production. Returns to labor (primarily wages) represent about two thirds of net output. Returns to other factors of production in industry as a whole were obtained from estimates of the distribution of the national income at factor cost. These returns were distributed among industries in proportion to the value of fixed assets in 1956.

The index of industrial production includes rough estimates of production in private handicrafts (which is not covered in official commodity statistics) based on employment trends in private handicrafts.

The commodity sample used for 1958-60 is virtually the same as that for 1948-57. For 1965 (plan), however, it is smaller in some industries, and official indexes of gross value of production had to be used for the machine building and food industries for lack of an adequate sample.

The value of total net industrial production at factor cost in 1956 was obtained from the Columbia University project mentioned above. This value represents payments to labor in industry plus that part of nonlabor returns (profits plus taxes minus subsidies) that was imputed to industry -- an imputation made on the basis of the distribution of fixed and working capital by economic sector. The value of net industrial production was distributed among individual industries according to the weights of these industries in 1956. In other years, values were obtained by multiplying the estimates for 1956 by the indexes.

Rounding in all tables is based on statistical significance. All computations, however, were carried out before the data were rounded.

Table 1

Investment in Czechoslovak Industry a/*
1948-60

Million 1957 Crowns

	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960 b/
Total industry	5,100	6,620	7,880	9,130	11,000	9,680	9,610	9,540	11,200	12,200	15,200	18,500	20,600
Machine building	970	1,470	2,020	2,310	2,800	2,160	1,730	1,480	1,850	2,260	3,070	3,730	4,070
Basic materials and power	2,800	3,290	3,880	4,950	6,680	6,550	6,750	6,790	7,560	8,590	10,300	12,300	13,500
Electric power	805	795	820	845	1,275	1,340	1,480	1,770	2,350	2,155	2,210	2,210	2,645
Fuel mining	140	135	120	135	120	170	355	305	240	800	865	1,375	1,340
Coal mining	620	600	525	605	935	1,105	1,265	1,255	1,640	1,950	2,440	2,370	2,875
Ferrous metallurgy c/	450	700	1,135	1,690	2,055	1,670	1,485	1,485	1,160	1,150	1,845	2,860	2,815
Nonferrous metallurgy c/	50	55	75	235	295	470	435	310	710	405	270	300	340
Chemicals	605	750	835	980	1,375	1,270	1,055	1,020	745	1,100	1,495	1,525	1,805
Rubber	20	25	25	40	50	35	35	30	50	80	80	85	95
Construction materials	105	230	345	425	575	485	635	610	660	955	1,070	1,530	1,555
Light industry	1,110	1,590	1,830	1,940	1,750	1,020	1,090	1,060	1,560	1,610	2,050	2,590	2,770
Wood	170	230	325	460	435	135	120	80	150	175	295	395	410
Paper	95	150	205	270	265	165	255	270	360	270	275	255	320
Glass	35	70	115	80	85	45	40	45	85	110	115	} 260	} 245
Porcelain and ceramics d/	10	15	15	20	20	20	20	20	25	25	30		
Foods	325	525	595	575	550	400	390	390	550	545	665	780	865
Textiles	220	425	395	385	280	160	180	175	265	325	405	500	540
Clothing	35	35	40	40	30	15	25	10	20	20	45	85	80
Leather	195	115	110	75	40	40	25	30	60	85	155	235	230
Miscellaneous d/	20	30	35	40	45	40	40	40	45	50	65	80	85
Statistical discrepancy e/	+215	+270	+150	-70	-230	-50	+40	+210	+185	-205	-160	-110	+290

* Footnotes for Table 1 follow on p. 37.

Table 1

Investment in Czechoslovak Industry a/
1948-60
(Continued)

50X1

a. [redacted]

Unless otherwise indicated, investments in the individual branches were calculated from indexes covering 1948-59 32/ and from estimates of the cumulative value of these investments in 1949-58. 50X1

The cumulative value of investments by branch in 1949-58 was estimated by distributing among the branches the three uses of investments -- additions to fixed assets, unfinished investments, and retirements -- over this period. Additions to fixed assets are from Table 3. Unfinished investments were distributed by branch in the same proportion as additions to fixed assets (excluding the "Miscellaneous" category). Retirements (Table 2), minus the reduction in assets in the "Miscellaneous" category, were distributed by branch in proportion to fixed assets in 1948.

The total investments of each branch during 1949-58 were divided by the cumulative indexes of investments for 1948-58 to calculate investments in 1948, and the resulting values were moved by the indexes to derive investments in 1949-59.

b. Investments by branch in 1960 are estimates based on the assumption that the distribution of investments was the same as in 1958-59 (average). The statistical discrepancy in 1960, however, is the amount necessary to make the algebraic sum of the statistical discrepancies for the individual years 1956-60 equal to zero.

c. Including ore mining. Official series on investments are broken down into ferrous and nonferrous metallurgy, while official series on assets combine the two. Investments in metallurgy over the 1949-58 period were apportioned between ferrous and nonferrous metallurgy roughly on the basis of employment.

d. Investments in the porcelain and ceramics branch and the "Miscellaneous" category were moved with the index for total industrial investments.

e. The statistical discrepancy includes the effect of errors and omissions.

Table 2

Derivation of the Estimated Value of Fixed Assets and Retirements
in Czechoslovak Industry
1948-60 and 1965

Values in Million 1957 Crowns

Year	Index of Fixed Assets a/*	Fixed Assets b/	Net Additions to Fixed Assets	Retirements		Gross Additions to Fixed Assets d/	Investments e/
				Value c/	Rate (Percent)		
1948	100.0	113,600				3,862	5,100
1949	103.1	117,100	3,500	900	0.8	4,429	6,620
1950	107.2	121,700	4,700	800	0.7	5,453	7,880
1951	112.6	127,900	6,100	1,000	0.8	7,100	9,130
1952	119.4	135,600	7,700	900	0.7	8,596	11,000
1953	124.9	141,800	6,200	900	0.7	7,167	9,680
1954	133.6	151,700	9,900	1,000	0.7	10,883	9,610
1955	141.0	160,100	8,400	700	0.4	9,088	9,540
1956	148.5	168,600	8,500	1,000	0.6	9,543	11,200
1957	158.1	179,500	10,900	1,400	0.8	12,293	12,200
1958	168.0	190,800	11,200	2,700	1.5	13,970	15,200
1959	182.0	206,700	15,900	3,900	2.1	19,830	18,500
1960	196.4	223,000	16,300	4,100	2.0	20,460	20,600
1965	287.2	326,200					
1961-65			103,200	30,900	2.4	134,000	146,000

* Footnotes for Table 2 follow on p. 39.

Table 2

Derivation of the Estimated Value of Fixed Assets and Retirements
in Czechoslovak Industry
1948-60 and 1965
(Continued)

a. For 1948-58, 33/; 1959, 34/; 1960, 35/; and 1965, 36/. The index for 1965 was adjusted upward to account for the revision of the investment plan in 1961-65.

b. The value of assets for 1948 was derived by dividing gross additions to fixed assets in 1949 (4,429 million crowns) by the percentage increase in net fixed assets of 3.1 percent plus the retirement rate of 0.8 percent assumed for fixed assets in 1949.

$$\frac{4,429,000,000}{3.1 + 0.8} = 113,564,000$$

The value of assets for 1949-65 was derived from the index of assets in column 1.

c. Retirements during 1949-59 were obtained by subtracting the calculated net additions to assets from the given gross additions. The value of these retirements is roughly consistent with available data on retirement rates of all productive assets for selected years. 37/ Retirements in 1960 are based on the assumption that the retirement rate was 2 percent. Retirements during 1961-65 were derived by subtracting net additions to fixed assets plus unfinished investments from investments. It was assumed that unfinished investments in 1965 were the same percentage of investments in 1961-65 as unfinished investments in 1960 were of 1956-60 investments.

d. Gross additions to fixed assets during 1949-57, 38/ are taken to be valued in 1957 prices. Data for 1958-59 were converted to 1957 prices by a price index [redacted] The value of gross additions to fixed assets in 1960 is the total of columns 4 and 5. 50X1

e. Investments in 1948-60 are from Table 1; [redacted] 50X1

Table 3

Value of Assets of Czechoslovak Industry, by Branch
1948-60

Million 1957 Crowns

	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Total industry a/	113,600	117,100	121,700	127,900	135,600	141,800	151,700	160,100	168,600	179,500	190,800	206,700	223,000
Machine building b/	20,700	21,700	23,000	24,800	27,100	28,500	30,600	32,100	33,500	35,400	37,500	40,500	43,500
Basic materials and power b/	43,400	45,300	47,800	51,300	56,300	60,900	68,000	74,300	80,500	88,700	96,500	107,400	118,600
Electric power	9,470	9,950	10,600	11,200	12,200	13,300	15,100	16,900	18,300	20,600	21,700	24,200	26,600
Fuel processing	6,450	6,520	6,580	6,580	6,650	6,650	6,840	6,970	7,870	8,260	8,810	9,540	10,300
Fuel mining	9,770	10,100	10,300	10,500	11,200	12,000	13,600	14,800	16,000	17,800	19,700	21,700	23,800
Ore mining	380	420	530	700	1,040	1,360	1,710	2,120	2,640	3,050	24,900	27,800	30,800
Metallurgy	10,100	10,500	11,200	12,600	14,000	15,100	16,400	17,500	18,300	19,800			
Chemicals	2,480	3,000	3,610	4,410	5,520	6,480	7,720	8,760	9,330	10,400	11,400	12,800	14,200
Rubber	600	610	630	660	700	720	760	780	850	920	960	1,040	1,120
Construction materials	4,080	4,200	4,360	4,650	5,020	5,300	5,910	6,440	7,220	7,870	8,990	10,400	11,800
Light industry b/	49,500	50,100	51,000	51,800	52,200	52,400	53,100	53,800	54,600	55,500	56,700	58,800	60,900
Wood	2,150	2,320	2,580	2,990	3,380	3,480	3,610	3,680	3,810	3,920	4,110	4,450	4,800
Paper	2,730	2,810	2,920	3,110	3,300	3,380	3,650	3,900	4,090	4,310	4,690	4,870	5,060
Glass	2,120	2,160	2,240	2,310	2,370	2,390	2,440	2,480	2,460	2,540	2,660	2,880	3,100
Porcelain and ceramics	820	830	860	880	900	900	910	920	910	910	950	820	820
Food	16,900	17,300	17,600	18,000	18,300	18,500	18,600	19,100	19,500	20,000	20,300	21,000	21,700
Textiles	14,800	15,100	15,400	15,700	15,800	15,800	16,000	16,100	16,100	16,300	16,400	17,000	17,600
Clothing	860	880	910	940	950	960	980	980	1,000	1,000	1,060	940	940
Leather	3,250	3,320	3,380	3,410	3,440	3,440	3,480	3,480	3,480	3,510	3,680	3,790	3,900
Miscellaneous c/	5,860	5,390	5,060	4,490	3,680	3,550	3,440	3,060	3,250	3,050	2,810	3,040	3,040

a. Total industrial assets are from Table 2.
b. The value of assets in the individual branches in 1948-59 was calculated from indexes of fixed assets in 1948-57 41/ and the percentage distribution of assets by branch in 1957, 42/ 1958, 43/ and 1959. 44/ The indexes cover state, local, and cooperative industry. The percentage distribution by branch covers only state industry. Rough estimates were made of the distribution of assets in local and cooperative industry in 1957-59 (1.7 percent of the total in 1957). It was assumed that the percentage distribution of additions to assets in 1960 was the same in 1960 as in 1959.
c. The miscellaneous category includes printing, fats and soap, refrigeration and storage, the mining of chemicals, and possibly a statistical discrepancy in 1948-56, when the category is a residual. In the early years the category may include private handicrafts, which were then of significant size. The decline in assets may reflect the absorption of private handicrafts into socialized industry.

Table 4

Value of Assets and Investments in Industrial Machinery and Equipment
in Czechoslovakia
1948-60

Million 1957 Crowns

Years	Value of Assets a/	Net Additions	Total Industrial Retirements b/	Investments c/
1948	29,500			2,570
1949	31,900	2,400	900	3,600
1950	34,800	3,000	800	4,350
1951-53		11,200	2,800	16,200
1953	46,100			
1954-55		9,700	1,700	10,100
1955	55,800			
1956	60,500	4,700	1,000	5,700
1957	65,800	5,300	1,400	6,230
1958	72,300	6,500	2,700	7,900
1959	80,900	8,600	3,900	9,280
1960	86,000	5,100	4,100	

a. The value for 1948 was obtained by applying the ratio of assets in machinery and equipment to total industrial assets (26 percent) 45/ to the value of total industrial assets in 1948 (Table 2).

[redacted] 50X1
50X1

b. Data from Table 2. It is assumed that all retirements in industry were used to retire wornout machinery and equipment.
c. Total industrial investments multiplied by the ratio of machinery and equipment investments to total industrial investments. 49/

Table 5

Indexes of Czechoslovak Industrial Output
1948-60 and 1965 Plan

1956 = 100

Year	Total Industry	Machine Building	Basic Materials and Power								Light Industry a/				
			Total	Electric Power	Fuel Processing	Fuel Mining	Metallurgy and Ore Mining	Chemicals	Rubber	Construction Materials	Total	Foods	Textiles, Clothing, and Leather	Glass, Porcelain, and Ceramics	Wood and Paper
1948	57.1	45.4	50.0	45.3	48.5	61.3	46.4	35.8	51.8	51.7	75.7	74.6	86.2	71.0	55.0
1949	62.9	52.0	53.2	49.9	57.9	63.1	50.4	39.3	65.5	49.3	83.8	81.6	97.3	76.0	59.0
1950	69.7	60.4	58.5	55.9	57.2	67.6	56.9	48.0	79.0	52.2	90.9	88.8	102.9	80.9	68.3
1951	73.3	67.0	62.1	62.1	67.9	68.6	62.6	48.5	73.0	54.2	91.5	91.4	99.6	78.0	74.2
1952	78.9	72.3	71.3	70.1	83.3	78.4	71.2	58.5	84.3	60.4	93.4	91.1	99.8	84.8	83.9
1953	81.8	78.6	76.8	74.5	80.3	81.0	81.8	61.5	74.9	70.8	90.4	88.7	95.6	78.8	83.4
1954	84.2	80.4	82.3	82.0	87.3	87.2	83.2	70.2	81.5	78.2	89.9	91.2	90.9	81.6	88.4
1955	94.1	94.2	90.7	90.5	96.7	90.8	91.8	86.6	86.0	89.6	97.8	93.9	101.8	94.8	96.3
1956	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1957	110.9	114.1	111.8	106.8	117.5	113.4	108.8	110.0	112.4	118.8	106.9	107.5	109.3	108.1	100.6
1958	124.4	137.2	122.5	118.2	128.3	127.8	115.6	122.7	111.2	129.1	114.8	114.0	119.2	111.8	106.3
1959	132.5	145.6	133.0	131.9	143.6	132.9	124.5	139.2	112.6	145.0	119.9	112.9	128.8	123.7	113.3
1960	145.6	162.1	147.3	147.3	154.8	146.0	139.9	157.1	128.6	156.3	128.4	118.4	136.9	133.0	127.1
1965 Plan	230.5	285.3	246.9	236.8	486.8	186.8	219.5	323.1	197.7	252.3	161.8	153.9	158.3	204.9	169.3

a. Including miscellaneous.

Table 6

Average Capital-Output Ratios of Czechoslovak Industry a/
1948-60

Year	Total Industry	Machine Building	Basic Materials and Power								Light Industry b/				
			Total	Electric Power	Fuel Processing	Fuel Mining	Metallurgy and Ore Mining	Chemicals	Rubber	Construction Materials	Total	Foods	Textiles, Clothing, and Leather	Glass, Porcelain, and Ceramics	Wood and Paper
1948	3.84	2.91	4.55	8.22	9.96	3.14	4.31	3.29	3.26	3.28	3.84	4.82	3.14	3.53	2.63
1949	3.60	2.67	4.46	7.83	8.42	3.14	4.13	3.62	2.62	3.54	3.51	4.49	2.86	3.35	2.58
1950	3.37	2.43	4.29	7.46	8.61	2.99	3.94	3.58	2.24	3.48	3.29	4.21	2.74	3.27	2.39
1951	3.37	2.37	4.33	7.07	7.26	3.03	4.03	4.32	2.54	3.57	3.32	4.17	2.89	3.48	2.44
1952	3.32	2.39	4.14	6.85	5.97	2.82	4.01	4.49	2.32	3.46	3.28	4.26	2.91	3.28	2.36
1953	3.35	2.32	4.16	6.99	6.19	2.92	3.82	5.02	2.69	3.12	3.40	4.42	3.04	3.56	2.44
1954	3.48	2.43	4.33	7.22	5.86	3.06	4.14	5.23	2.60	3.15	3.47	4.34	3.20	3.49	2.44
1955	3.29	2.18	4.29	7.32	5.41	3.22	4.07	4.81	2.56	3.00	3.23	4.33	2.90	3.05	2.33
1956	3.26	2.14	4.22	7.18	5.89	3.15	3.98	4.44	2.39	3.00	3.21	4.13	2.96	2.87	2.34
1957	3.13	1.98	4.16	7.60	5.26	3.09	3.98	4.50	2.29	2.76	3.05	3.95	2.73	2.72	2.42
1958	2.96	1.74	4.13	7.23	5.14	3.03	4.10	4.43	2.42	2.90	2.90	3.78	2.54	2.75	2.45
1959	3.01	1.78	4.23	7.20	4.97	3.22	4.25	4.37	2.59	2.97	2.88	3.94	2.43	2.55	2.43
1960	2.96	1.71	4.22	7.11	4.98	3.21	4.18	4.30	2.44	3.13	2.79	3.89	2.35	2.51	2.30

a. Fixed assets divided by net output.
b. Including miscellaneous.

Table 7

Sectoral Distribution of Capital Investment in Czechoslovakia a/
1949-65

Percent

	Excluding Capital Repairs				
	1949-52	1953-57	1958-59	1956-60	1961-65
Industry	46.5	37.8	41.3	40.2	45.4
Agriculture (includes forestry)	8.8	13.7	16.6	15.9	15.2
Transportation and communications	13.6	11.3	10.2	9.8	10.8
Construction	2.2	2.2	2.9	2.6	2.3
Housing	15.3	19.8	15.2	} 31.5	14.0
Other	13.6	15.2	13.8		12.3

	Including Capital Repairs		
	1949-52	1953-57	1958-59
Industry	46.4	39.0	42.1
Agriculture (includes forestry)	8.4	12.1	14.6
Transportation and communications	14.5	13.9	12.6
Housing	14.6	17.4	13.4
Other	16.1	17.6	17.3

a. 50/

Table 8

Gross Capital Investment in Industry
as a Percent of Gross National Product in Czechoslovakia a/
Selected Years, 1948-60

Percent

Year	At Factor Cost	In Market Prices
1948	8.0	6.0
1949	9.5	7.1
1950	10.5	7.9
1952	13.5	10.2
1953	12.8	9.6
1955	12.3	9.3
1956	13.9	10.5
1957	14.5	11.0
1958	16.9	12.8
1959	19.0	14.3
1960 b/	21.2	16.0

a. In 1956 prices. Including capital repairs.

[redacted] Annual investments at factor cost and at market prices were then divided by GNP in the respective years. GNP series are estimates of this Office.

b. Estimates. Capital repairs are unknown.

50X1
50X1
50X1

Table 9

Shares of GNP Originating in Industry and Gross Capital Investment in Industry as a Share of GNP in Czechoslovakia and Selected European Countries a/
1952, 1958, and 1952-58 Average

	Share of GNP Originating in Industry		Gross Capital Investment in Industry as a Share of GNP b/
	1952	1958	1952-58 Average
Czechoslovakia c/	30.5	36.9	14.1
Italy c/	33.8	38.0	7.2
West Germany d/	44.7	48.3	8.0
Austria d/	46.7	47.8	9.2
France c/	N.A.	N.A.	8.3
UK c/	39.9	41.6	6.6

a. The data for Czechoslovakia are estimated; [redacted] 50X1
50X1

b. Including construction, except in Czechoslovakia and the UK. For Czechoslovakia the average excludes 1954 (the source is Table 8). The average for Italy covers 1953-58 and that for France, 1954-58.

c. At factor cost; in 1956 prices for Czechoslovakia, current prices for France and the UK, and 1954 prices for Italy.

d. In 1954 market prices. In terms of factor cost, the share would be only slightly higher.

Table 10

Indexes of Industrial Employment and Output per Worker
in Czechoslovakia and Selected European Countries a/
1954 and 1958

	1954 (1950 = 100) b/		1958 (1954 = 100) b/	
	Employment c/	Output per Worker d/	Employment c/	Output per Worker d/
Czechoslovakia	114	106	110	135
Italy	102	137	102	128
West Germany	127	123	120	113
Austria	105	127	109	121
France	101	121	108	123
UK	106	108	101	105

a. 1958 was a good year for Czechoslovakia but one of the poorer years for Western Europe. The above relationships would not be significantly different, however, in 1959.

50X1

c. Excluding mining for France and the UK.
d. Index of output per worker equals index of output divided by index of employment.

Table 11

Indexes of Fixed Assets, Employment, and Output in Czechoslovak Industry
1951, 1954, 1957, and 1960

	1951 (1948 = 100)			1954 (1951 = 100)			1957 (1954 = 100)			1960 (1957 = 100)		
	Assets	Employment a/	Output	Assets	Employment a/	Output	Assets	Employment a/	Output	Assets	Employment a/	Output
Total industry	112.6	108.2	128.4	118.7	105.2	115.0	118.3	108.8	131.7	124.2	111.2	131.3
Machine building	120	124	148	123	120	120	116	112	142	123	109 b/	142
Basic materials and power	118	108	124	133	112	133	130	108	136	134	107 b/	132
Electric power	118	118	137	135	110	132	137	104	130	129	104 b/	138
Fuel processing	102	88	140	104	107	129	121	107	135	125	106 b/	132
Fuel mining	108	100	112	129	115	127	131	109	130	134	104 b/	129
Metallurgy and ore mining	126	123	135	137	112	133	126	103	131	135	110 b/	129
Chemicals	178	114	135	175	110	145	135	114	157	136	110 b/	143
Rubber	110	100	141	115	111	112	121	120	138	122	108 b/	114
Construction materials	114	100	105	127	108	144	133	111	152	149	108 b/	132
Light industry c/	104	101	121	103	94	98	104	107	119	110	105 b/	120
Foods	106	114	122	104	94	100	107	102	118	108	100 b/	110
Textiles, clothing, and leather	106	93	116	102	90	91	102	111	120	108	107 b/	125
Glass, porcelain, and ceramics	108	102	110	105	91	105	103	112	132	114	113 b/	123
Wood and paper	125	110	135	119	102	119	113	104	114	120	105 b/	126

a. Indexes pertaining to employment apply to production workers (delnici) only. 56/ For total industry, a more comprehensive series of employment has also been published, the indexes of which are 108.4, 107.5, 109.3, and 108.7, respectively, for the periods indicated above. 57/
b. Index for 1959.
c. Including miscellaneous.

Table 12

Indexes of Fixed Assets, Employment, and Output of Czechoslovak Industry
1955, 1960, and 1965 Plan

	1955 (1950 = 100)			1960 (1955 = 100)			1965 Plan (1960 = 100)		
	Assets	Employment a/	Output	Assets	Employment a/	Output	Assets	Employment a/	Output
Total industry	131.5	112.2	135.0	139.3	118.4	154.7	146.2	109.1 b/	158.4
Machine building	140	140	156	136	123 c/	172	144	N.A.	176
Basic materials and power	155	117	155	160	119 c/	162	166	N.A.	168
Electric power	159	121	162	158	104 e/	163	N.A.	N.A.	161
Fuel processing	106	100	169	148	113 e/	160	N.A.	N.A.	314
Fuel mining	145	114	134	160	114 e/	161	N.A.	N.A.	128
Metallurgy and ore mining	167	124	161	157	114 e/	152	N.A.	N.A.	157
Chemicals	242	121	180	162	120 e/	181	N.A.	N.A.	206
Rubber	125	111	109	142	130 e/	150	N.A.	N.A.	154
Construction materials	148	115	172	182	114 e/	174	N.A.	N.A.	161
Light industry d/	106	96	108	113	114 c/	131	109	N.A.	126
Foods	109	94	106	113	103 e/	126	N.A.	N.A.	130
Textiles, clothing, and leather	105	92	99	109	113 e/	134	N.A.	N.A.	116
Glass, porcelain, and ceramics	109	90	117	116	123 e/	140	N.A.	N.A.	154
Wood and paper	138	111	141	130	106 e/	132	N.A.	N.A.	133

a. Indexes pertaining to employment apply to workers (delnici) only. 58/ For total industry, a more comprehensive series of employment has also been published, the indexes of which are 119.2 and 116.2, respectively, for 1951-55 and 1956-60. 59/
b. 60/. (Index of output divided by index of productivity.)
c. In order to get the distribution of employment in the main sectors in 1960, the rate of increase in total employment was applied to the 1959 level of employment.
d. Including miscellaneous.
e. Index for 1959.

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