

# AMORTIZATION OF MACHINERY AND EQUIPMENT IN SOVIET INDUSTRY



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IN SOVIET INDUSTRY

(Summary)

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FOREWORD

Current Soviet developments in the field of amortization, primarily the amortization of industrial machinery and equipment, are summarized in this report.



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AMORTIZATION OF MACHINERY AND EQUIPMENT IN SOVIET INDUSTRY\*

Summary and Conclusions

In the postwar period the Soviet government, like other governments, has reexamined its policy with respect to the amortization (or depreciation) of fixed assets, especially industrial machinery and equipment. The inadequacy of official prewar rates usually is ascribed to the postwar acceleration of technological progress, a development that has increased the incidence of obsolescence in industrial equipment. In the USSR an additional factor behind current reform of the amortization system is the recently announced decision to use industrial fixed assets more intensively, a practice that normally tends to shorten the useful lives of industrial equipment.

Following World War II, both the US and the USSR, unlike some other industrial nations, continued to adhere to the orthodox ("original [historical] cost - useful life") concept of depreciation accounting as the basis of depreciation policy. Now, however, the USSR is preparing to adopt a form of "price-level" depreciation accounting. Beginning in 1963, Soviet fixed assets are to be amortized on the basis of their current replacement cost instead of their historical cost. At the same time, a revised schedule of standard amortization rates containing newly computed allowances for obsolescence and physical wear is to be introduced.

Although it is premature to pass judgment on the new Soviet amortization rates at this time, there is evidence that the rates will be higher than previously, particularly in the case of machinery and equipment. The average rate for the category production machinery and equipment, which accounts for approximately one-fourth of the value of the productive fixed assets in Soviet industry, reportedly is being set at 13.3 percent. The rates for the categories power machinery and equipment and transportation equipment are to be 9.9 and 8.8 percent, respectively.

\* Although this report anticipates the revision of the US Treasury Department's Bulletin "F," the report was already in process of publication at the time that the new depreciation regulations (Depreciation Guidelines and Rules, US Internal Revenue Service Publication No. 456, July 1962) were actually issued. Because it will be some time before the impact of these new regulations can be studied, it has not seemed advisable to hold up the publication of this report.

These standard rates reflect a significant increase above the basic rates of 1930, which have remained essentially in use up the present time.

In the USSR, where virtually all industrial fixed assets are state property, amortization deductions have been a source of financing capital investment for many years. Accordingly, a rise in Soviet amortization rates could signify an intention to increase the amount of capital investment that is financed through amortization deductions. When considering the significance of amortization rates and amortization deductions in the USSR or when comparing them with depreciation rates and depreciation accruals in the US, however, allowance should be made for certain features of the Soviet system, primarily the division of the amortization rate between a subrate for capital investment and a subrate for capital repair.

Unlike most US depreciation rates, Soviet amortization rates are not the reciprocals of the service lives of the fixed assets to which they pertain, precisely because they include a very substantial allowance for capital repair. Under the new over-all standard rate of 13.3 percent for the category production machinery and equipment in the USSR, for example, a subrate of 6.5 percent is to be established for the capital investment component of amortization, and a subrate of 6.8 percent is to be established for the capital repair component.

The allocation of the amortization deductions of Soviet industry follows the prevailing division of the over-all amortization rate between the subrate for capital investment and the subrate for capital repair. Under the 1960 plan, for example, approximately 2.7 billion rubles\* (47 percent) of the amortization deductions of state-owned industrial enterprises and construction organizations were to be used for financing capital investment in industry, and approximately 3.1 billion rubles (53 percent) were earmarked for capital repair. Therefore, when Soviet economists discuss amortization deductions as a percentage of capital investment, they ordinarily refer only to those amortization deductions that are computed by using the capital investment subrate. At present, about one-sixth of the centralized capital funds invested annually in Soviet industry (including the construction industry) is currently financed from these amortization deductions. In general, amortization deductions have tended to be

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\* Ruble values in this report are given in new rubles established by the Soviet currency reform of 1 January 1961. A nominal rate of exchange based on the gold content of the respective currencies is 0.90 ruble to US \$1. This rate, however, should not be interpreted as an estimate of the equivalent dollar value of similar US goods or services.

weighted slightly in favor of capital investment in most branches of heavy industry and heavily in favor of capital repair in light industry and in the food and paper industries.

The amortization deductions that industrial enterprises deposit with the state for use as centralized capital investments may be redistributed within industry in accordance with the requirements of the state investment plan. For this reason it is sometimes said that these amortization deductions represent a form of state tax on fixed capital. The state may use such funds either for the replacement in kind (simple reproduction) of fixed assets that are being retired from use or for net additions (expanded reproduction) to existing stocks of fixed assets.

There is no real counterpart of the Soviet capital repair system in US industry. Virtually all capital repairs in Soviet industry are financed from amortization deductions, and these deductions are deposited by industrial enterprises with the local Gosbanks in special accounts earmarked for the use of the depositor. Generally the deductions are deposited before the repair work itself is performed. Capital repair provides some leverage for deferring the replacement of fixed assets in Soviet industry, although sometimes at considerable economic cost. Of the total amortization deductions for capital repair, a very significant share is used for the repair of machinery and equipment. Based on 1956 data, [redacted] 60 to 75 percent of the outlays for capital repair of productive fixed assets in Soviet industry were expended on equipment alone in that year.

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A significant point to be noted about the Soviet capital repair program is that it is a form of capital investment. Capital repair is referred to in Soviet publications as partial replacement of fixed capital (in distinction to full replacement accomplished through bona fide capital investment). The capital repair program is designed to restore machinery and equipment to its original operating condition, insofar as is possible, through the replacement or repair of working parts at regularly scheduled intervals during the service life of the item of machinery and equipment. When the capital repair of a fixed asset is completed, the cost of the work is entered as an offset to amortization charges, thereby restoring value to the asset and extending its service life.

Because amortization deductions for capital repair do represent a capital consumption charge in Soviet industry and are used for capital replacement, they are relevant to Soviet policy on capital investment. If Soviet officials alter the scale of the capital repair program but leave the over-all amortization rate intact, either more or less capital is available for investment.

The assumption that amortization deductions for capital repair represent an alternative form of capital investment is implicit in Soviet criticism leveled at the costliness and ineffectiveness of capital repair relative to capital investment in new machinery and equipment. Economically a capital repair program of such magnitude would not be feasible in a market economy and probably is not entirely justified in the Soviet planned economy. For example, Soviet spokesmen acknowledge that the cost of the capital repair of a given item of equipment may well exceed the cost of completely replacing it with a new asset. Certainly over the entire service life of an item of machinery and equipment subject to four or five capital repairs an inordinate amount of resources is expended to preserve an asset that is usually no more productive at the end of the repair process than it was when originally acquired.

The principal justification of the Soviet capital repair program has been and continues to be the unavailability of a sufficient number of new assets for replacement. This unavailability follows in some measure from the priority given to newly constructed plants in the allocation of new machinery and equipment as well as to chronic problems in the supply of machinery and equipment.

Directly calculable costs are not the sole criterion for judging the efficacy of the capital repair program. The program was adopted originally as a measure of central control to maintain standards of operating efficiency in state enterprises at a time when many personnel could not or would not voluntarily maintain them. To this day the capital repair program is centrally planned and is monitored through the centralized finance system. The extensive use of capital repair of old machinery and equipment to permit the forced expansion of new industrial plant probably has exacted a high economic price. For the present and immediate future, however, the capital repair program appears to be a firmly established and integral part of the Soviet system of amortization.

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Table 1

USSR: Comparison of Composite Amortization Rates in Industry  
1938, 1950, 1952, and 1956

Industry	Percent of Full Original Cost of Fixed Assets											
	1938			1950			1952			1956		
	Over-All Rate	Subrate		Over-All Rate	Subrate		Over-All Rate	Subrate		Over-All Rate	Subrate	
	Capital Investment	Capital Repair		Capital Investment	Capital Repair		Capital Investment	Capital Repair		Capital Investment	Capital Repair	
Total industry	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	5.3	2.7	2.6
Food												
Food	6.0	3.2	2.8	6.3	2.0	4.3	6.3	2.2	4.1	6.8	3.1	3.7
Fish	6.0	3.2	2.8	6.5	0.5	6.0	6.5	0.7	5.8	6.5	0.9	5.6
Meat and Dairy	6.0	3.2	2.8	5.0	1.5	3.5	5.0	1.5	3.5	5.6	1.9	3.7
Heavy												
Chemical	5.6	3.2	2.4	4.5	1.1	3.4	4.5	1.6	2.9	4.6	2.2	2.4
Coal	5.6	3.2	2.4	4.2	0.9	3.3	4.2	1.1	3.1	4.3	1.7	2.6
Construction materials	5.6	3.2	2.4	5.5	0.7	4.8	5.5	1.3	4.2	5.2	2.6	2.6
Construction of heavy industry enterprises	5.6	3.2	2.4	5.8	1.4	4.4	5.8	2.3	3.5	N.A.	N.A.	N.A.
Electric power stations	5.6	3.2	2.4	5.3	1.5	3.8	5.3	2.1	3.2	4.5	2.3	2.2
Electrotechnical	5.6	3.2	2.4	4.5	2.2	2.3	4.5	2.5	2.0	4.5	2.7	1.8
Ferrous metallurgy	5.6	3.2	2.4	4.8	1.8	3.0	4.8	2.2	2.6	4.7	2.6	2.1
Petroleum	5.6	3.2	2.4	6.5	2.8	3.7	6.5	3.3	3.2	5.6	3.6	2.0
Light	5.5	1.9	3.6	6.5	0.7	5.8	6.5	1.1	5.4	6.6	2.3	4.3
Machine building												
Agricultural machine building	5.5	3.3	2.2	5.6	2.0	3.6	5.6	2.3	3.3	5.6	3.6	2.0
Communications equipment	5.5	3.3	2.2	4.4	1.9	2.5	4.4	2.1	2.3	4.4	2.9	1.5
Construction and road machine building	5.5	3.3	2.2	4.6	2.1	2.5	4.6	2.3	2.3	4.6	2.7	1.9

Table 1

USSR: Comparison of Composite Amortization Rates in Industry  
1938, 1950, 1952, and 1956  
(Continued)

Industry	Percent of Full Original Cost of Fixed Assets											
	1938			1950			1952			1956		
	Over-All Rate	Subrate		Over-All Rate	Subrate		Over-All Rate	Subrate		Over-All Rate	Subrate	
		Capital Investment	Capital Repair		Capital Investment	Capital Repair		Capital Investment	Capital Repair		Capital Investment	Capital Repair
Machine building (Continued)												
General machine building	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	5.7	2.8	2.9
Heavy machine building	5.5	3.3	2.2	5.5	3.0	2.5	5.5	3.4	2.1	5.6	3.6	2.0
Machine and instrument building	5.5	3.3	2.2	5.5	2.0	3.5	5.5	2.5	3.0	5.6	2.9	2.7
Machine tool building	5.5	3.3	2.2	5.6	3.2	2.4	5.6	3.5	2.1	5.7	3.7	2.0
Motor vehicle and tractor	5.5	3.3	2.2	5.5	3.0	2.5	5.5	3.2	2.3	5.6	3.6	2.0
Transport machine building	5.5	3.3	2.2	4.8	1.8	3.0	4.8	2.1	2.7	4.8	2.4	2.4
Timber and paper												
Paper	6.0	3.0	3.0	4.7	1.7	3.0	4.7	1.7	3.0	5.0	2.3	2.7
Timber	6.0	3.0	3.0	4.7	1.7	3.0	4.7	0.2	4.5	5.0	0.5	4.5
Transportation												
Maritime fleet	N.A.	N.A.	N.A.	7.0	0	7.0	7.0	1.0	6.0	N.A.	N.A.	4.6
River fleet	N.A.	N.A.	N.A.	4.0	0	4.0	4.0	0.1	3.9	N.A.	N.A.	2.8
Railroads	N.A.	N.A.	N.A.	6.5	0	6.5	6.5	0.5	6.0	N.A.	N.A.	5.2

Table 2

USSR: Amortization Deductions as a Source  
 of Financing Centralized Capital Investment  
 in the Economy and in Industry a/  
 1956-60

Billion Current Rubles

<u>Year</u>	<u>Centralized Financing of Capital Investments</u>		<u>Amortization Deductions for Financing Capital Investments</u>	
	<u>Economy</u>	<u>Industry b/</u>	<u>Economy</u>	<u>Industry b/</u>
1956	16.08	10.44	2.31	1.89
1957	17.88	11.12	2.49	1.83
1958	20.38	12.99	2.77	2.06
1959	23.31	13.55	3.25	2.23
1960	26.24	15.00	3.61	2.70

a. Plan data.

b. Including the construction industry.

Table 3

USSR: Amortization Deductions as a Source  
 of Financing Centralized Capital Repair  
 in the Economy and in Industry a/  
 1959-60

Billion Current Rubles

<u>Year</u>	<u>Centralized Financing of Capital Repair</u>		<u>Amortization Deductions for Financing Capital Repair</u>	
	<u>Economy</u>	<u>Industry b/</u>	<u>Economy</u>	<u>Industry b/</u>
1959	6.00	2.74	4.72	2.72
1960	7.00	3.14	5.30	3.10

a. Plan data.

b. Including the construction industry.

Table 4

USSR: Amortization Charges as a Percent of Total Outlays  
 for Production in Selected Industries a/  
 Selected Years, 1940-59

Industry	Percent						
	1940	1950	1952	1954	1955	1957	1959
Total industry	2.2	2.7	N.A.	N.A.	3.4	3.4	3.5
Coal	3.1	3.4	4.7	N.A.	N.A. b/	5.1	5.7
Construction materials	4.1	3.9	5.1	5.4	N.A.	N.A.	6.3
Electric and thermal power	10.5	9.7	N.A.	14.1	16.8	19.4	20.3
Food	1.0	1.0	1.2	1.3	N.A.	N.A.	1.2
Sugar refining	N.A.	N.A.	N.A.	N.A.	2.9	1.8	1.9
Meat processing	N.A.	N.A.	N.A.	N.A.	0.5	N.A.	0.5
Dairy products	N.A.	N.A.	N.A.	N.A.	0.9	N.A.	1.1
Light	0.8	0.8	0.9	1.03	N.A.	N.A.	0.8
Cotton textile	1.1 c/	N.A.	N.A.	N.A.	1.1	1.2	1.3
Garment	N.A.	N.A.	N.A.	N.A.	0.2	N.A.	0.3
Machine building and metalworking	2.9	N.A.	4.0 d/	N.A.	4.1	3.9	3.9
Machine tool building	3.7	4.5	4.9	N.A.	N.A.	N.A.	N.A.
Metallurgy	3.3	3.8	4.3	N.A.	5.1 e/	5.6 e/	5.8 e/
Petroleum extraction	36.5 c/	N.A.	N.A.	N.A.	42.8	45.2	46.5
Timber	N.A.	2.3	2.9	3.2	4.0	N.A.	4.7

a. Amortization is an essential element in calculating the cost of output.

b. In 1955, amortization charges amounted to 6.3 percent of the outlays of production in coal extraction and 1.2 percent in coal beneficiation.

c. Data are for 1939.

d. Data are for 1953.

e. Data are for ferrous metallurgy.

Table 5

USSR: Relative Value Weights for Primary Categories  
 of Industrial Equipment in Various Industries a/  
 1956

Industry	Percent of Total Productive Fixed Assets			
	Power Equipment	Production Equipment	Transportation Equipment	Total for Equipment <u>b/</u>
Total industry	9	25	7	41
Chemical	6.3	33.5	3.8	43.6
Coal	5.5	16.4	6.1	28.0
Construction and road machine building	3.4	37.0	3.7	44.1
Construction materials	6.7	29.8	8.4	44.9
Electric power stations	28.2	7.5	1.3	37.0
Electrotechnical	4.6	33.4	2.9	40.9
Ferrous metallurgy	7.4	32.8	4.6	44.8
Fish	3.6	7.7	61.7 <u>c/</u>	73.0
Food products	9.5	27.4	7.2	44.1
Heavy machine building	6.0	35.0	3.1	44.1
Instrument building and automation media	3.5	44.1	3.0	50.6
Light	6.6	47.5	2.8	56.9
Machine building	5.2	40.6	3.2	49.0
Machine tool building	2.6	42.1	2.9	47.6
Meat and dairy products	6.1	18.8	6.7	31.6
Motor vehicle	5.8	44.0	2.1	51.9
Paper and woodworking	12.5	35.9	4.1	52.5
Petroleum	3.8	18.9	3.4	26.1
Timber	9.1	14.2	34.3	57.6
Tractor and agricul- tural machine building	6.3	41.6	2.6	50.5

a. Data are as of 1 January. Industries listed conform to ministerial organization as of 1956.

b. The total is computed as the sum of the three categories of equipment.

c. Including the fishing fleet, which comprised 58.4 percent of the productive fixed assets of the ministry.