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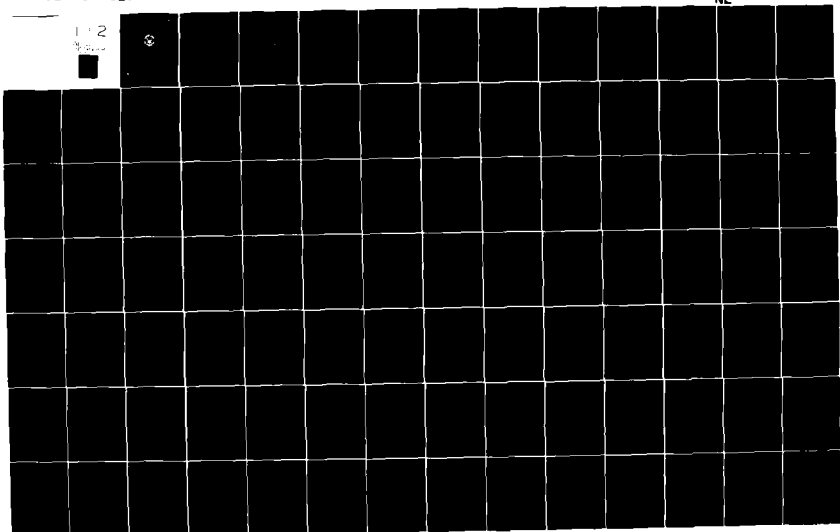
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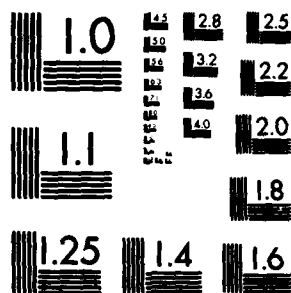
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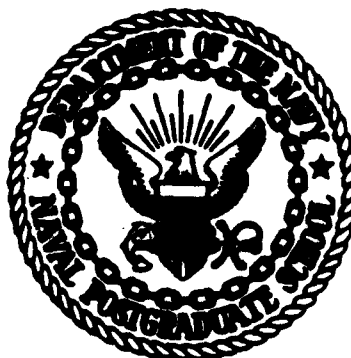
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**THE ECONOMIC CONSEQUENCES OF
AN INVASION OF POLAND BY THE
SOVIET UNION**

by

William Allen Weronko

September 1981

Thesis Advisor:

R. E. Looney

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The Economic Consequences of
an Invasion of Poland by the
Soviet Union

by

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Lieutenant, United States Navy
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Submitted in partial fulfillment of the
requirements for the degree of

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from the

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ABSTRACT

This thesis examines the economic situation and implications of a Soviet invasion of Poland. The analysis concerns the state of the Polish and Soviet economies and the possible economic effects of an invasion by the Soviet Union of Poland. The hypothesis offered is that the weaknesses of the economic system of the U.S.S.R. are of a magnitude that an invasion of Poland would have such devastating economic consequences that it is the major inhibiting factor to any like action. Although a Soviet armed invasion is not completely ruled out, the economic realities of both Poland and the Soviet Union impose formidable constraints on any attempts to crush the Polish reform movement in a way that would result in Western economic retaliation.

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I. INTRODUCTION

The Soviet Union in the past, has shown strong inclinations to put down any liberalization efforts, in the Eastern bloc countries, by force. During 1968, in Czechoslovakia, the Russian Army crushed a budding reform effort of much less intensity than is now being experienced in Poland. The Kremlin leaders are under immense pressure to crush Poland's rebellion. The birth of a powerful independent trade union movement poses a grave threat, in Soviet eyes, to their hold on Eastern Europe. Nevertheless, the Russian Army is being held at bay and invasion does not appear imminent.

This paper's thesis is that the restraints on Soviet action are, by and large, economic in nature. The Soviet economy is showing signs of extreme weakness. An invasion would strain the Russian economic system to the near breaking point and thus remains a strong inhibitor to Soviet action. The Soviet economic ills appear to be of such depth and magnitude that no near term solutions will solve their dilemma allowing them to resolve the Polish problem by force of arms.

On July 1, 1980 the Polish government of Edward Gierek reduced food subsidies which raised selected meat prices 40-60 percent.¹ These price increases themselves, though affecting only 29% of meat sales, costing households well under 1/2 of 1 percent of their disposable incomes and were less extensive than those which provoked the riots of December

1970 and June 1976, triggered scattered labor strikes throughout Poland.² Initially the strikes were low-key and accompanied mostly economic demands that were responded to by ad hoc wage increases. Soon however they became general in the Baltic area and took on a political character as well. By August the labor unrest coalesced into a well organized and disciplined workers movement with 350,000 Polish laborers on strike in the major industrial centers of Gdansk, Gdynia, Sopot, Szczecin and Elblag.³

The price increases were to a large extent caused by external pressures of Western banking concerns. On April 24, 1980 fifty Western bankers gathered at the Victoria Hotel in Warsaw. They wanted Poland to reduce costly subsidies of food. The Polish pricing system kept food, particularly sugar and meat, well below market levels, at an annual cost to the Polish government of more than \$6 billion, amounting to 25 percent of 1979 national expenditures.⁴ The Poles who were looking for an additional \$500 million loan and were well aware of the need for structural changes and price-mechanism reforms, did not demur.

The Polish government in an attempt to diminish the chances of adverse reaction, initially announced the price increases on only a few cuts of meat, which had long since disappeared from the market place anyway. The government clearly thought a gradual implementation of price increases throughout Poland would halt the reaction which forced the recall of increases in 1970 and 1976. The leadership was proven to be wrong.⁵

By the end of August the government of Gierek was forced by the deteriorating economy to grant unprecedented demands to the workers. By September, independent trade unions were being organized and Edward Gierek had been removed as head of the Polish Communist Party. The collapse of the Gierek leadership ostensibly appeared to be caused by selective meat price increases. More accurately the collapse reflected the degree of political and social bankruptcy of the party and state in Poland.

The labor movements themselves were dramatically different from the riots and strikes that had trembled Poland thrice since 1956. The recent unrest was initiated, arranged and dominated by the workers. In times past, workers have revolted when the Communist Party was visibly fractured and the intelligentsia were insurrecting. This time the strikes occurred when Gierek had the most homogeneous leadership since World War II. The intellectuals warned of the crisis but offered no leadership or solutions. Dissident groups formed after the 1976 price riots had no popular following and felt isolated from the working class.⁶

This time the workers prevailed in a political vacuum. The dissidents and their intellectual colleagues had to run to catch up. The leadership had no other choice but to concede to the strikers' demands. The workers were too strong and soon too well organized to be put down by force even if the Army could be counted on. Poland's existing debt made it impossible to buy off localized disaffection with special food

shipments. The Communist Party itself proved to be so weak that it could neither lead nor stop the workers. The ultimate crime had been committed in Soviet eyes -- the Party had lost control.

The agreements in Gdansk and the growing power of the Polish union movement pushed back the boundaries of economic and political change beyond that which had been thought of as possible since 1968, when Soviet troops terminated the reforms in Czechoslovakia. The Soviet leadership certainly understood the seriousness of the Polish crisis. In ideological terms an unacceptable group, the free trade unions, had achieved a significant degree of real power in Poland. Somehow or other, this situation had to be changed, for none of the other bloc nations had entered the 1980s free from the specter of real economic crisis. Poland was the first and most severe case of economic failure but it appeared as if it would not be the last. The Soviets would have to weaken or emasculate the free trade unions, and full party control reestablished over the Polish proletariat or face the possibility of growing unrest that could affect not only the bloc countries but the Soviet Union as well.

The Kremlin leadership took an early decision to demonstrate their concern and to increase their options by a large-scale military build-up in and around Poland. The Soviet forces in the area remained at a high level of readiness after the Autumn Warsaw Pact exercises, especially the units in the

western military districts of the USSR, and East Germany as well as the two tank divisions in Poland. Existing units were substantially reinforced while continued exercises were held in surrounding areas. By late November 1980 the Soviets had massed a force of 25-30 divisions in a high state of readiness. United States defense officials estimated that the positioned forces could mount an invasion with only two or three days notice.⁷ Furthermore, General Ivanovski, the former Commander-in-Chief of Soviet forces in East Germany, was put in command of the Belorussian military district, the most probable route for an invasion of Poland.⁸

At the time of this writing the Soviet forces have failed to invade. The option of invasion certainly remains open, but it is clearly an option of desperation to the Soviet leadership. The reasons why the Soviets failed to act with force as they had in Hungary, Czechoslovakia, and of late, Afghanistan, are many, and the understanding of these reasons are imperative for Western countries if they are to deal effectively with the Soviet Union in the future.

The risks of an invasion of Poland would be considerable. Among the most obvious risks and the great imponderable in any invasion scenario is how much resistance the Poles would put up. Their 317,500-man armed force is the largest in the entire Warsaw Pact aside from the Soviets and could conceivably cause the Russian Army considerable opposition. According to some media sources, Polish generals have warned Soviet commanders

that military intervention would be regarded as an act of war and be resisted by force of arms.⁹

Even if a Soviet invasion were to overcome these obstacles, the subsequent military occupation would face extreme difficulties. As Solidarity leader Lech Walesa candidly put it, "Soviet tanks can occupy the country but they will not get it to work again."¹⁰ The economic problems of a Soviet invasion could be overwhelming to the faltering Soviet economy. The Polish economic problems would be more intractable than before. The need for the Soviet Union to provide welfare assistance to a large Polish population, the requirement to absorb the enormous national debt of Poland, combined with considerable western economic sanctions which are sure to be levied against the Soviet Union would cause monumental stresses and pressures on an already strained economy.

This paper will look at the economic restraints and possible consequences of a Soviet invasion of Poland. Following the introduction, Section two provides an in depth examination of the Soviet economic system -- its problems and prospects. It dwells on the present day weaknesses of the Soviet economy as well as the trends which undoubtedly would be greatly exacerbated by the enormous strain a Polish invasion would place on the Soviet economy. The third section of this thesis will address a detailed analysis of the Polish problem, analyzing the economic weaknesses and political forces of today's Poland. The last part of this paper provides a summation of

the economics of a Soviet invasion of Poland. It further provides short term forecasts of possible Soviet actions and their probable consequences on Poland and the Soviet economic health.

II. SOVIET ECONOMIC PROBLEMS AND PROSPECTS

The Soviet Union faces formidable economic problems in the 1980s which shall put severe strains on an already burdened economy. The Soviet economic plan for 1981 through 1985, calls for the lowest economic growth rates since World War II which illustrates the downward trend that has become increasingly more apparent in the recent past.

Soviet economic plans are historically quite optimistic documents with a poor track record for exact accomplishment. The draft five year plan, unveiled in Moscow December 1, 1980 targets a total economic growth rate of 18 to 20 percent. That goal is a sharp comedown from the target of 24 to 28 percent in the 1976-80 plan. This earlier target was not achieved. Actual growth in that five year period was only 18.7 percent or 3.7 percent annually, and in 1980 the growth rate dropped to an estimated 3.5 percent.¹¹

The overall Soviet economic performance for the past quarter century has in many respects shown outstanding performance. The Soviet Gross National Product grew at an annual rate of about 5.1 percent. In contrast, the United States has had a less stellar performance with a 3.8 percent annual growth rate.¹² The gain for the Soviet consumer, resulting in a standard of living lower than nearly all industrial countries, was nonetheless quite impressive. Since 1950, per capita consumption has risen at an average rate of nearly

4 percent, a gain in material goods and services of over two and a half times. Considerable gains have occurred across the board, more and better food, housing, clothing, as well as personal and community services.¹³

The Soviet diet remains starchy and the nation's inefficient supply and distribution system results in recurrent shortages. Despite, this, the rise in per capita consumption has satisfied the expectations of the consumer until recent times. Consumption of meats and fats by Soviet citizens has risen from 26 kilograms per capita in 1950 to 57 kilograms per capita in 1977. During the same period, per capita consumption of starchy foods, grain products and potatoes, fell from 413 kilograms to 262 kilograms.¹⁴ In 1950, the average Soviet bought one pair of shoes per year; in 1977, three pair were purchased. Although still quite meager by Western standards, household durables have exhibited a dramatic rise. In 1960, only 4 of every 100 families owned a refrigerator or washing machine. Only 8 of every 100 families owned a television set, while automobiles were just for the elite. By 1977, nearly two-thirds of all families owned some kind of refrigeration system and washing machines, and over three quarters had a television set. Approximately 4 percent of all families owned a car.¹⁵

A nation with a significant increase of per capita consumption, as has been experienced in the Soviet Union, ordinarily must give up something like guns, but the rapid

expansion of the Soviet GNP has been sufficient to sustain both. In the past fifteen years military spending has increased at about the same ratio as the overall GNP, while during the past several years the rate of growth has been about twice that of the GNP, accounting for about 11 to 18 percent of all output. By contrast, defense spending by the United States, accounted for approximately 8 percent of the GNP in 1970 during the Vietnam War and for only 4.9 percent in 1979 with a slow rise to 5.9 percent by fiscal year 1982.¹⁶ The Soviets, according to Senator Nunn, "have built the most awesome military machine the world has ever seen."¹⁷

The Soviet economic growth performance statistically parallels many war destroyed economies of other industrialized countries. The most striking difference is its distinctive downward trend at a relatively low standard of living. The prospect for the next decade for the Soviet economy is continued slow growth if not stagnation or even decline. The possibilities of large standard of living increases for Soviet citizens are few. An invasion of Poland by the Soviet Union would result in the Soviet citizens being forced to suffer significant economic hardships in the short term and continued economic penalties in the long. The pertinent question is at what level of economic depravation Soviet citizenry are willing to endure and for how long before substantial worker unrest unfolds.

The factors responsible for the slow down of economic growth have been known for some time. Attempts have been made by Moscow leaders to offset the downward trend with less than satisfactory results. The major causes of the economic growth slow down are:

1. Inefficient, poorly motivated workers;
 2. A slowdown in growth of capital investment;
 3. An inefficient and undependable agricultural system;
- and,
4. A lack of hard currency earners needed to pay for technology and grain purchases.¹⁸

During this decade we are likely to see these problems intensify. Furthermore, two new problems are becoming apparent which will greatly aggravate the economic strain: a sharp decline in the growth of the working population and an energy and raw material constraint.¹⁹

A. DEMOGRAPHICS

The Soviet economy has been hampered since the 1960s by slow technological advancement and now faces an additional constraint in the 1980s, a slow growth of the labor force. The Soviet formula for economic success has been heavily dependent on labor, generally a significantly larger amount than other developed nations. To maintain the growth rate of the 1970 level will require a large emphasis on productivity rather than labor.

The Soviet Union is now experiencing an unprecedented decline in the size of increments to the population of able-bodied workers. This trend is aggravated by the period of schooling required for the upcoming worker force which is longer than for previous groups, resulting in a shorter work life as long as the pension age remains the same. Moreover, the proportion of the population in the pension ages will rise from 15 percent at the present to 19 percent by the end of this century. At the same time the source of the population increase is becoming increasingly more centered around the Caucasus, Northern Caucasus, and especially in Soviet Central Asia which are largely underdeveloped regions. These areas, unlike the rest of the country, are undergoing a demographic explosion among its native Muslim population. Furthermore, the Muslims of Soviet Central Asia who could enter the labor force not only lack material incentives to migrate but are unwilling to venture outside their own territories and are often not disposed to factory work as such, even in their own cities. Moreover, Soviet industry is unable to provide enough material incentive to encourage voluntary migration, especially to rich and labor-hungry but climatically difficult areas, such as most of Siberia. With or without this movement there will be serious labor shortages in the industrialized areas of the country and the rate of economic growth possibly will slow down.²⁰

Annual increments to the Soviet working class averaged 2.5 million during 1971-75 and will decline to 1.6 million by the mid-1980s.²¹ To maintain the GNP growth at the 1970 level, an increase in labor productivity of 3.5 percent is needed for the next five years, while a 4.5 percent increase in productivity will be required from 1986-1990 to maintain a 5 percent GNP growth rate.²² Realization of the labor force constraint is one factor in the uncharacteristically low production plans for the eighties.

Michael Rywkin writing in Problems of Economics, compares the Soviet labor shortages as "quite similar" to those of the West.²³ In the discussion of the distribution of labor in the USSR, Rywkin fails to mention the degree to which the population is a result of the violent demographic history of the Soviet state. The make up of the work force and the slowing of its growth are the results not only of low birth rates of the 1960s but an overall aging population. The aging of the population is quite unsimilar to the aging of the United States "baby boom" phenomena, but rather the result of normal births between the various slaughters of the past revolutionary, precollectivization period of the 1920s.

(Refer to tables 2-1 and 2-2)

The age/sex pyramids (Table 2-3) of the Soviet Union reflect the changes of the vital rates and demographic catastrophes which have occurred since 1897. Helene Carrere D'Encousse reports in her book, Decline of an Empire, that between 1914

and 1946, the estimated demographic deficit of the various wars and purges cost the Soviet nation sixty million people, or one-third of the post war population.²⁶

Table 2-1²⁴

Soviet Population Growth

<u>Years</u>	<u>Soviet Population</u> (millions)	<u>Annual Increase</u> (percentage)
1951	208.8	-
1960	212.3	1.83
1961	216.2	1.83
1962	220.0	1.70
1963	223.4	1.56
1964	226.6	1.43
1965	229.6	1.30
1966	232.2	1.13
1967	234.8	1.10
1968	237.1	0.95
1969	239.4	0.97
1970	241.7	0.94
1979	262.4	0.92

Table 2-2²⁵

Age Group Percentage Compared to Total Soviet Population

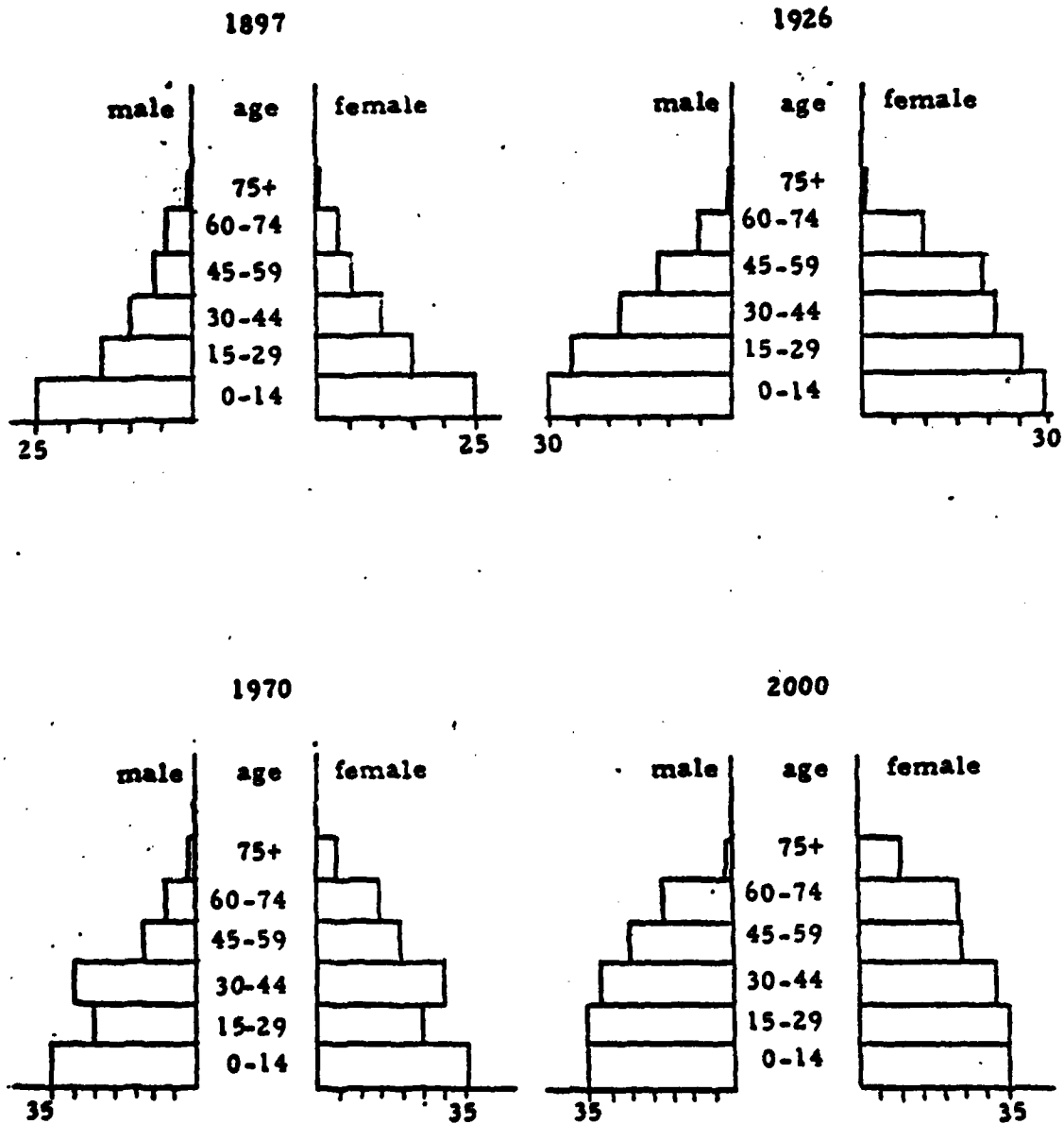
<u>Age Group</u>	<u>1897</u>	<u>1939</u>	<u>1959</u>	<u>1970</u>
0-19 years	48.8	49.3	37.4	38.0
20-59 years	44.8	44.0	53.2	50.0
60 years and over	6.8	6.7	9.4	11.8

The First World War cost the Soviets about three million people; in the Second World War, they lost twenty to thirty million lives, seven million of which were soldiers. In addition to these, considerable losses were incurred during the various slaughters between 1918 and 1936. The civil war alone accounted for seven million civilian deaths. In 1921, famine

Table 2-3²⁷

Population Pyramids, 1897-2000

(millions)



resulted in the loss of five million lives. Two million emigrants fled the revolution, resulting in the loss of an estimated 8.5 million births. As of 1921, the population losses stood at twenty-six million. The relatively calm years of the New Economic Policy of the 1920s produced a surge of births shown in Table 2-3. The respite, however, proved to be brief.

The 1930s ushered in a new Stalin initiated butchery during which Khrushchev estimated that 10 million Soviet lives were lost. In all probability, the figure is significantly higher. The 1937 census revealed that a gap of 14.7 million lives existed between forecast and reality. Collectivization and mass deportation killed many, as did the resulting famine of 1933-34 which alone killed more than 3 million infants. The purges also claimed at least another 1 to 2 million lives. These catastrophes are readily discernable in the age pyramids. The general shift in the age of the population becomes quite noticeable in the 1970 pyramid and the drop of birth rate in the pyramid for 1970 and 2000.

Another indicator of the increasing average age of the Soviet citizen is the death rate. The rate of Soviet deaths per one thousand inhabitants, as shown in Table 2-4, reveals that it hit its lowest rate in 1961 and has been rising ever since. This is primarily the result of the fact that as the population grows older, people die in greater numbers despite advances in medicine and a somewhat longer life expectancy.

Table 2-4²⁸Birth, Death, Natural Growth Rates of
the Soviet Population

Year	Per 1,000 inhabitants			Infants dying before age 1, per 1,000
	Births	Deaths	Natural Increase	Births
1913				
a) within pre- 1939 borders	47.0	30.2	16.8	273
b) within pre- sent day bor- ders of USSR	45.5	29.1	16.4	269
1926	44.0	20.3	23.7	174
1928	44.3	23.3	21.0	182
1937	38.7	18.9	19.8	170
1938	37.5	17.5	20.0	161
1939	36.5	17.3	19.2	167
1940	31.2	18.0	13.2	182
1950	26.7	9.7	17.0	81
1955	25.7	8.2	17.5	60
1956	25.2	7.6	17.6	47
1957	25.4	7.8	17.6	45
1958	25.3	7.2	18.1	41
1959	25.0	7.6	17.4	41
1960	24.9	7.1	17.8	35
1961	23.8	7.2	16.6	32
1962	22.4	7.5	14.9	32
1963	21.1	7.2	13.9	31
1964	19.5	6.9	12.6	29
1965	18.4	7.3	11.1	27
1966	18.2	7.3	10.9	26
1967	17.3	7.6	9.7	26
1968	17.2	7.7	9.5	26
1969	17.0	8.1	8.9	26
1970	17.4	8.2	9.2	25
1971	17.8	8.2	9.6	23
1972	17.8	8.5	9.3	24
1973	17.6	8.6	9.0	26

The decline in fertility, also shown in Table 2-4, began in the early 1960s. The causes for the fertility decrease can be partly attributed to classical factors such as the high state of urbanization and some additional conditions unique to the Soviet Union. Table 2-5 clearly shows a declining number of women between the 16-30 year age bracket, the most favorable years for maternity. As the Soviet society gets older as a whole, there are relatively fewer women of child bearing years. Moreover, women are marrying at an older age which reduces the period of fertility; table 2-6 reveals this additional demographic problem.

Perhaps the most significant pressure for keeping family size down in urban areas is the critical shortage of apartments and day care centers. The Soviet citizen's rising aspirations for a better life tend to keep the level of births at a minimum. Only since 1974 has a concerted national policy been adopted to encourage births. Incentives such as increasing the number of day care facilities, providing "aid for children" payments of a nominal 12 rubles per child per month to low income families, partially paying a woman's salary during a period of one years maternity leave, and awarding such titles as "Heroine Mother," "Glory of Motherhood Order," and motherhood medals for women with large families have been offered.³¹

It seems unlikely that these inducements will provide for a substantial boost in the work force and may result in

Table 2-5²⁹

Women of Child-Bearing Age
Percentage of the Soviet Population

	Number of Women (million)			Percentage of the Soviet population		
	1939	1959	1970	1939	1959	1970
Total number of women 16-49 years	48.8	58.5	60.8	25.4	28.0	25.2
of which: age 16-29	24.3	26.9	23.9	12.7	12.9	9.9
age 30-40	24.1	31.6	36.9	12.7	15.1	15.3

Table 2-6³⁰

Number of Married Women (per 1000 women)

Age Bracket	1939	1959	1970
From age 16 and over	605	522	580
16-19	140	112	105
20-24	614	501	559
25-29	787	759	827
30-34	818	776	853
35-39	800	725	819
40-44	759	623	790
45-49	688	549	719
50-54	593	483	603
55-59	497	433	501
60-69	363	361	371
Age 70 and over	168	169	196

short-term work force reductions. There has, though, been a recent rise in fertility of females between the ages of 15 to 19 years old. It is presently impossible to say if this signifies any long term trend.³² Recently there has also been a rapid rise in infant mortality from 22.9 in 1971 to 30.5 deaths per 1000 live births in 1975.³³ Since 1975 the Soviets have stopped reporting infant mortality rates. Additionally, death rates in every age group have risen dramatically in recent years. Between 1970 and 1975 death rates increased almost 20 percent for people in their fifties, by more than 30 percent for those in their forties. The causes behind these figures are not clear. In a recent study by Murray Feshbuck and Christopher Davis, they speculate that alcoholism, pollution, accidents, suicide and declining medical care due to insufficient investment are all contributing factors.³⁴

The 1970 Soviet census revealed that not only have birth rates continued to fall, but an increasing differentiation between national regions had developed which is completely altering the population balance of the country.

Table 2-7 brings to light that the previous balance between Slavs and non-Slavic nationalities is in a state of rapid flux, with birth rates and increased population growth shifting markedly in favor of the non-Slavic elements. Table 2-8 lists the percentage composition of Soviet ethnic groups from 1897-1970.

Table 2-7³⁵

Population Trends in the Republics
(present borders of the USSR)
(in thousands)

<u>Republics</u>	<u>1913</u>	<u>1939</u>	<u>1959</u>	<u>1970</u>	1970	1970	
					% over 1959	% over 1970	
USSR	159,153	190,678	208,827	241,720	116	262,442	109
RSFSR	89,902	108,377	117,534	130,079	111	137,552	106
Ukraine	35,210	40,469	41,869	47,126	113	49,757	106
Belorussia	6,899	8,912	8,056	9,002	112	9,559	106
Uzbekistan	4,334	6,347	8,119	11,800	145	15,391	130
Kazakhstan	5,597	6,082	9,295	13,009	140	14,685	113
Georgia	2,601	3,540	4,044	4,686	116	5,016	107
Azerbaudzhan	2,339	3,205	3,698	5,117	138	6,028	118
Lithuania	2,828	2,880	2,711	3,128	115	3,399	109
Moldavia	2,056	2,452	2,885	3,569	124	3,948	111
Latvia	2,493	1,885	2,093	2,364	113	2,521	107
Kirghizia	864	1,458	2,066	2,933	142	3,529	120
Tadzhikistan	1,034	1,458	1,981	2,900	146	3,801	131
Armenia	1,000	1,282	1,763	2,492	141	3,031	122
Turkmenia	1,042	1,252	1,516	2,195	142	2,759	128
Estonia	954	1,052	1,197	1,356	113	1,466	108

Table 2-8

Percentage of Ethnic Groups Compared
with Total Population

<u>Ethnic Groups</u>	<u>1897</u>	<u>1926</u>	<u>1959</u>	<u>1970</u>
Russians	44.4	47.5	54.6	53.4
Ukrainians	19.4	21.4	17.8	16.9
Belorussians	4.5	3.6	3.8	3.7
Tatars	1.9	1.7	2.4	2.5
Turko-Moslems	12.1	10.1	10.3	12.9
Jews	3.5	2.4	1.1	0.9
Europeans	3.9	3.6	3.8	3.8
Lithuanians	1.3	1.2	1.1	1.1
Finnish	2.3	2.2	1.5	1.4
Moldavians	1.0	1.2	1.1	1.2

The population of the Moslem republics has climbed from 24 million to 35 million in one decade.³⁷ The projections indicate that the increase of the able-bodied ages in Central Asia and Kazakhstan will actually exceed that of the USSR as a whole during the 1980s. V. Perevedentseu, a Soviet

demographic commentator, noted that each 1,000 women will bear an average of 1,986 children during their lives. In Padjhikistan, however, the average will be 6,071.³⁸

The unequal population growth is a formidable obstacle for Kremlin planners. The Central Asian region is largely resource poor, while the eastern regions, which occupy the greater portion of the territory of the USSR, holds 87 percent of all potential energy resources of the country (including 89 percent of coal reserves and 66 percent of natural gas resources) and 70 percent of the hydroelectric resources. Siberia and the Far East possess rich reserves of iron, copper, lead, zinc, and nickel ores, mercury, tin, mineral salts, water and forest resources, considerable fish resources, etc. However, only 25 percent of the country's population live in the eastern region.³⁹

The territorial redistribution of labor resources will be necessary if the Soviet government is to make efficient use of the large population growth among the non-Slavic peoples. To do so, about 9 million workers would have to be moved between 1980-90. The overwhelming weight of evidence indicates that this is not occurring. On the contrary, patterns of migration show net flow from other regions of the USSR into Central Asia, Kazgkhstan and the transcaucasian regions. Between 1959-72, for every 100 who migrated out of the region, 159 moved in. This high influx is primarily caused by the inability of the region's population to provide skilled labor

Table 2-9⁴⁰

Net Migration in the R.S.F.F.S.R.,
Kazakhstan, and the Central Asian Republics, 1950-77
(In thousands, figures may not add to totals due to rounding)

Year	R.S.F.S.R.	Kazakhstan	Central Asia	Kirgiziya	Tadzhikistan	Turkmenistan	Uzbekistan
1950	-208	48	113	6	11	-6	101
1951	-124	70	-24	-37	29	-17	0
1952	318	-75	58	-13	5	2	65
1953	-3	-14	-11	-16	0	-9	15
1954	172	150	-3	2	7	2	-14
1955	-202	358	-37	-14	7	-10	-20
1956	-138	54	9	-13	9	-5	18
1957	-248	44	31	-23	11	7	36
1958	-168	137	35	12	2	7	14
1959	-285	186	51	9	16	-1	25
1960	-176	175	71	16	16	2	38
1961	-119	180	109	18	28	3	60
1962	-92	171	89	7	26	3	53
1963	-69	-28	89	24	15	2	49
1964	-90	58	58	10	15	1	31
1965	-152	26	63	19	11	-3	36
1966	-147	33	27	17	1	-7	58
1967	-164	30	87	17	6	6	16
1968	-93	-16	82	15	7	-2	62
1969	-84	-19	61	7	11	10	33
1970	-124	-5	22	2	4	2	13
1971	-88	4	40	-4	14	7	23
1972	-72	-8	32	-1	1	5	27
1973	-56	2	44	1	3	5	35
1974	-30	-5	42	3	6	9	25
1976	116	-73	13	-4	0	7	11
1977	176	-71	-35	-9	-1	1	-26

for its growing urban centers and it is the result of sun belt seekers attempting to avoid the difficult climatic conditions of the north.⁴¹ (Refer to table 2-9)

The prospects for substantial out migration of the high birth rate areas seems distinctly unfavorable. A study conducted by Murray Feshback identified a myriad of reasons why migration is not likely to increase in the near future. The following are cited by Feshback as the basis for his predictions:⁴²

1. Living Standards: Income per family is higher in Central Asia and the Caucasus than in the U.S.S.R. as a whole. Although per capita income is lower, the cost of living is low enough to negate the desirability of higher wages in the R.S.F.S.R.
2. Cultural Factors: There exists a traditional opposition to the inter-marriage of Moslems with Russians. Also, 'The Muslim peoples of the Central Asian Republics feel that their region is the cradle of civilization... They have a deep attachment to the ancestral lands and believe that to leave the abode of Islam for the abode of war is a sin against the community.'
3. Poor educational preparation for industry: There is a definite shortage of vocational-technical schools in Central Asia and enrollment in Central Asian republics averages 7 per 1000 population vs. 15 in the R.S.F.F.S.R.
4. Job Opportunities and Industrial Development: There are numerous positions available in industrial centers of Central Asia for trained Moslems. Although investment has slackened, it appears that there will be ample opportunities for skilled wageworkers to remain in Central Asia.
5. Poor Knowledge of Russian Language: The inability of most Central Asians to speak Russian, even as a second language, limits their usefulness for working in industrial centers of the R.S.F.S.R.

6. Birthrates: High birth rates and large families prevent movement in general, but especially to heavily populated industrial areas.

A. U. Topilin, in a study centering on material disincentives for migration, noted that the standard of living in eastern regions is extremely crude, that there has been a large lag in the number of houses, schools, hospitals and service centers in Siberia and the Far East which is the result primarily of an inadequate volume of investment and construction facilities. He concluded that it will be very difficult to move the eastern regions to an advantageous position within a 5 to 7 year time frame.⁴³

Central Asians have further demonstrated an extreme reluctance to move from their homeland and even more so, from their farms. This reluctance is shown by the high percentage of the area's population in agriculture. Only two Central Asian republics have less than 30 percent of the population in agriculture, while only two European republics have more than 30 percent in the same field.⁴⁴

Forced migration is presently doubtful. The Soviets would have to face a political reaction not only from Central Asian republics, but also from Moslem countries with whom the U.S.S.R. has shown that it wishes to maintain close relations.

The decrease of the number of workers entering the market and the unequal population growth present the Soviet economic planners with a strong need to obtain productivity growth through labor innovation. Soviet planners are hoping that a

tighter labor market will surface "hidden labor reserves" thereby making their use more efficient. Past efforts have shown some success in this area. The Shehekin Experiment, which began in 1967, was implemented to reduce extraneous labor and is now standard procedure in most enterprises. Under the experiment, wages saved by reducing employees, were distributed among the remaining workers.⁴⁵ It is felt, however, that most such slack has already been removed from industrial manning and further reductions of manning will be counter productive, unless a major program of labor saving device production is instituted.

Farm personnel have been the traditional reservoir of labor. According to the estimates given, the share of the labor force in agriculture dropped from 54.0 percent in 1950 to 30.7 percent in 1970 and again to 21.8 percent in 1975.⁴⁶ The absolute figure for agriculture workers is 35 million persons. This is still more than 7 times that of comparable American figures. Nevertheless, as table 2-10 shows the working population is getting increasingly older. The residual laborers are largely unskilled and elderly and fail to provide agriculture with the efficient labor needed. Further migration from rural to urban areas will undoubtedly adversely affect agricultural output.

The Soviet Union has little room for labor expansion as already a large segment of society composes the work force. In 1970, 89 percent of the females and 93 percent of the males were working. Those outside the work force were mainly full

Table 2-10⁴⁷

USSR: Urban and Rural Population by Age

million persons

<u>Age</u>	<u>Urban</u>		<u>Rural</u>	
	<u>1959</u>	<u>1970</u>	<u>1959</u>	<u>1970</u>
Total	100.0	136.0	108.0	105.7
0-14	26.6	33.9	35.0	36.4
15-59	65.6	88.0	61.9	54.9
15-19	8.1	13.7	8.4	8.3
20-34	30.7	34.1	26.9	17.9
35-59	26.8	40.2	26.6	28.7
60 and over	7.8	14.1	11.9	14.4

time students, disabled or residents of institutions, leaving the only additional sources among the 16-19 year olds and the retired.⁴⁷

The Soviet retirement policy is liberal, even in comparison with other communist countries (55 for women, 60 for men). The 1970 census showed little participation in the labor force by those of retirement age. This is thought to be illusionary because the census had no category for pensioners working part time. Nevertheless, the labor force can receive a one time gain by increasing the retirement ages.

The labor shortage problem is considered serious and not easily solved. Some present efforts include the importation of foreign labor. In 1973, indications of the use of foreign labor first became evident. Most interesting is the utilization of 20,000 East Europeans in the building of the Orenburg

pipeline. Also noted were some 30,000 Bulgarians, 7,000 North Koreans and 3,000 Finns for use on various work projects. With a work force of 156 million, the overall effect of foreign labor, however, is small.

The military with its 4-4.5 million able bodied men would seem a likely candidate for force reduction to benefit the civilian economy. Nevertheless, it is not considered likely in the years ahead, that the size of the military sector will be reduced. Despite overall increased scarcity of investment funds, the military maintains an enormous and growing share of the economic resources of the nation. This shows a large commitment to the military, indicating a distinct preference for military power over economic growth. It seems unlikely that the Soviets will reduce military manning if for the only reason of the need to adequately staff current construction projects underway. Further, a large force reduction would be necessary to have an appreciable affect on the work force of more than 156 million workers. Such reductions appear unlikely and would require a complete reorientation of priorities which would be wholly uncharacteristic of those in power at the present time.

The best bet still appears to be improvement of productivity. In March of 1975, N. Rogorsky, head of the Labor Department and member of the State Planning Committee (GOSPLAN) made reference to the gradual elimination of heavy manual labor for the achievement of better utilization on labor; he noted,

however, that there was no current program for mechanization.⁴⁹ On the other hand, some Soviets argue that increased consumer goods and better housing are possibly more important to higher labor productivity than additional capital stock. Consumer goods, however, have made little headway in the past few years.

Considering past performance and future plans, most experts believe that the Soviets' efforts will not be entirely successful and a downturn in their economy is inevitable.⁵⁰ Population and migration trends seem not to be cooperating with Soviet needs for an improved economic climate.

B. THE ENERGY CONSTRAINT

In 1967, the Polish analyst Stanislas Albinowski suggested that by 1980 the CMEA countries would find themselves in an oil deficit by as much as 100 million tons per year and that it would increase thereafter.⁵¹ Since that time, Western commentators have periodically addressed themselves to the issue of Soviet oil production.

In 1976, just after the Soviets published their five year plan, the Central Intelligence Agency (CIA) predicted that both the oil and natural gas targets would be underfilled by a considerable amount.⁵² The real shockers, however, were published in early 1977. Three reports, two concerning Soviet oil prospects and one on the general oil situation, brought the energy situation in the Soviet Union into the limelight. These publications, which in some cases radically departed

from the conclusions of other public materials, have given rise to lively debate which continues to this day.

The most important aspects of the original CIA report were the assertions that:

"The Soviet oil industry is in trouble. Soviet oil production will soon peak, possibly as early as next year and certainly not later than the early 1980's. The maximum level of output is likely to be between 11 and 12 mmbd (500-600 million tons), but it is not likely to be maintained and the decline, when it comes, will be sharp. Before 1985, the USSR probably will find itself not only unable to supply oil to Eastern Europe and the West on the present scale but also having to compete for OPEC oil for its own use. Although there will be some substitution of coal and gas for oil in domestic use, the scale of such substitution will be small before 1985. Neither hydroelectric power transmission from the east, nor the construction of nuclear powerplants can afford much relief until well past 1985. We estimate that the Soviet Union and Eastern Europe will require a minimum of 3.5 mmbd/(175 million T/Y) of imported oil by 1985. At worst, slumping production could lead to import requirements as large as 4.5 mmbd (225 million T/Y)."⁵³

The CIA analysis of Soviet oil production had changed little publicly from 1977 until the Director of the CIA published a statement in 1980. In testimony to the Senate Energy Committee, Admiral Turner noted that, "... the Communist countries as a group are projected to shift from a net export position ... to a net import position of at least 1 million bpd (50 million tons per year) in 1985."⁵⁴ Although the Director's statement reiterated the belief that Soviet oil production in 1985 would not exceed 500 million tons, it is clear that the Agency has backed off its 1977 prediction of net CMEA imports of oil reaching 175-225 million tons by

mid-1980s. Furthermore, this statement concedes that the Soviets will not need to import oil for themselves in the next five years.

In early May 1981, CIA analyst James Noren, speaking before Soviet study scholars at Harvard University stated that the CIA has upgraded its estimate of the Soviet's 1985 oil output to between 10 million and 11 million barrels a day (500-600 million T/Y). Professor Marshall Goldman, who is an economics professor at Wellesley College and the Associate Director of Harvard's Russian Research Center, commenting on these latest CIA figures expressed the opinion that even these figures are too pessimistic. A draft of the CIA report calls 1980 the record year for Soviet oil production, but Mr. Goldman says 1981 production has been running about 2.5% ahead of last year's 11.9 million barrel-a-day rate.⁵⁵

Whatever the exact situation of Soviet oil production is, one point stands clear: Soviet petroleum production is not living up to Kremlin expectations. The 1978 goal for oil production set in December 1975 at 580 million T/Y, was lowered in December 1977 to 575 million T/Y. The actual figure was 571 million T/Y, or about 70,000 bpd below the revised plan or 170,000 bpd below the original goal. In 1979, the production goal was lowered from 610 million T/Y to 593 million T/Y. Actual output was 586 million T/Y. The 1980 production plan was 620 to 640 million tons while output totaled just 603 million tons. (Refer to table 2-11)

Table 2-11

Soviet Oil Production 1960-80⁵⁶

	<u>In million tons</u>		<u>Annual percent increase</u>
	<u>Actual</u>	<u>Plan</u>	
1960	147.8		1960-65 = 11.0
1965	242.4		1965-70 = 7.9
1970	353.0		1970-75 = 5.7
1975	491.0	496	8.6
1976	519.7	520	5.8
1977	546.0	550	5.1
1978	571.4	575	4.7
1979	586.0	593	2.6
1980	603.0	620-640	2.9

Soviet oil production has not peaked. As table 2-11 illustrates, it has risen from 546 million tons in 1977 to 586 million in 1979 and 603 million in 1980.

Nevertheless, the picture given in the table is one of an industry where the growth rate is slowing down dramatically, whether measured in percentage increase or actual physical increments. Moreover, it is an industry whose targets are not being met with the degree of underfulfillment of 37 million tons in 1980.

On balance the CIA has been correct in identifying some basic problems in the Soviet oil industry and the implications of the possible solutions. The CIA emphasizes that the emergence of a Soviet energy problem could affect developments ranging from the world price of oil to political stability in Eastern Europe. Falling energy output would make it much more difficult for the Soviet Union to meet domestic growth

targets or maintain commitments to Eastern Europe. A Soviet Union faced with the prospects of an energy deficit could react in a number of different ways. Controls and belts could be tightened at home or the Soviets could try to assure their access to Middle East oil. They might even accept wholesale Western assistance in their oil development.

To some extent, all of the Soviet options involve the use of Western technology. In fact, the availability of advanced energy equipment and technology is still the limiting factor in Soviet energy development. In past successful efforts to increase oil production, the USSR relied on domestic resources for equipment and know-how. More recently, the Soviets have encountered ever more difficult exploration and development problems that have forced them to turn to the West for modern equipment and technology to maintain increases in oil output. As greater emphasis is placed on deeper drilling, offshore exploration and development in Arctic regions, and enhanced recovery operations in older producing regions, the Soviet Union will have to rely more heavily on imports of Western equipment and technical assistance. For example, the sophisticated seismic equipment and digital processing units could facilitate the mapping of complex traps - both structural and stratigraphic - in the perma frost areas of East and West Siberia and in the Barents and Kara Seas.

An invasion of Poland by Soviet forces would certainly be accompanied by strong trade embargos from the West which

would most probably include oil development and production equipment. The Soviet oil problems are increasingly requiring the use of Western technology which in itself may not be enough to halt the fall off of growth in Soviet oil production. Without it the chances are slim that Soviet oil production could remain at its present output level with a sharp fall off being quite likely.

The effects of a significant decline in Soviet oil production would be a catastrophe of unprecedented proportions not only to the Soviet nation but also to Eastern Europe. With the CMEA nations heavily dependent on cheap Soviet oil and with their extremely limited hard currency earnings capability, a cut off of oil from the USSR would spell economic ruin for most of the Warsaw Pact countries.

The Soviet Union faces serious problems in oil production which is likely to result in a no-growth position by the mid-1980s and a possible energy decline beginning as early as 1985. The result of such a decline of the Soviet Union should not be under estimated. Since 1935, 85 percent of all growth in Soviet energy production was accounted for by crude oil and natural gas.⁵⁷ Furthermore, in 1980 the Soviet Union exported 75 million tons of oil which accounted for 50 percent of its hard currency earnings.⁵⁸ The \$11 billion received in 1980 for petroleum and petroleum products could have covered the cost of the massive grain imports which were purchased that year, or the large quantity of Western technological items

which prop up their economy. The loss of either or both could have enormous effects on the economic and social health of the USSR.

The Kremlin leadership is not unaware of the problems facing oil production. A major shift in energy policy was initiated at the December 1977 plenum of the Central Committee of the Communist Party. This policy called for a crash program to concentrate oil industry resources in West Siberia, the area with the most sizable output increases in recent years.

Despite the massive resource shift, the Soviet leadership faces difficult problems, which could prove to be impossible to overcome and maintain output growth for the next decade in the best of circumstances. It is generally recognized among world oil experts that even under the most favorable assumptions, Soviet oil production cannot continue to increase indefinitely and although it has been claimed that totals will increase through 1990, the stronger impression is that production will peak in the near future at a level that the country will attempt to hold through 1990 or perhaps commence a slow decline starting in 1985.

The Soviet oil production problem is certainly not the result of lack of commitment. The Soviets expend as much effort on producing oil as all the free world countries combined and the effort is growing in magnitude. Due to obsolete equipment and low worker productivity, however, the results are only a fraction of those of the West. For example in 1976,

the Soviets only drilled one-fifth the footage as did the U.S. firms even though roughly the same number of rigs were employed. Total Soviet drilling for oil and gas in 1980 was less than 78.2 million feet. By comparison total U.S. drilling is estimated at 273 million feet. During 1966-70 total Soviet capital investment in the oil industry was about \$2.4 billion. By 1978 the figure was \$7.6 billion and current outlays are believed to be close to \$11 billion or about 13 percent of all Soviet industrial capital investment.⁵⁹

The post war history of the Soviet petroleum industry is one of large increases in production with relatively small additional costs. By 1970, production was increased dramatically with only a 210 percent rise in drilling and only a 51 percent increase in rigs (1119 to 1760). This was possible by the extremely rich and accessible oil deposits in the Ural-Volga region. The output went from 1000,000 bpd in 1950 to 4.2 million in 1970.⁶⁰ By 1970, older fields in the Ukraine, North Caucasus and Azerbaydzhan started to decline in production, while the fields of the Urals-Volga leveled off. Only by over working the West Siberian fields were production goals met.

The crux of the Soviet oil production problem is that 25 percent of Soviet oil comes from the giant Siberian field called Samotlor. Samotlor production appears to be leveling off and may have already peaked. The controversial December 1977 plan calls for concentrating resources on oil and gas

development in West Siberia's Tyuman'Oblast. The most immediate consequence of the December plenum has been the decision to pull drilling brigades out of the Volga-Urals Fields and place them in West Siberian sites. The change of drilling policy seems to be based on the appreciation that: (a) the declining prospects for the Samotlor oil fields, (b) the critical rundown of West Siberian oil reserves following a decade of insufficient exploration; (c) the steeply rising level of resources and manpower needed to drill more and more wells in increasingly less productive deposits farther and farther from established support bases and transportation.⁶¹

The Soviet leadership is gambling that production increases from West Siberia will more than compensate for the likely shortfall in the Volga-Urals. Recent indications show this effort has paid off. In the long run, however, concentration on Tyumen' will weaken a more broadly based effort that might hold greater promise for the future. No giant oilfield has been found in West Siberia in the last 10 years, while all of the large promising structures in West Siberia reportedly have been drilled.⁶² The Soviets estimate that to replace reserves produced during 1976-80, they had to find 21 billion barrels. This figure exceeds estimated discoveries during this time by almost 50 percent.

The oil industry in the Soviet Union is burdened with additional problems. According to Arthur A. Meyerhoff, a

Tulsa based consultant who specializes in Soviet oil production, the technology used is nearly thirty years behind their American counterparts. Their techniques optimize short term gains while minimizing long term production. For example, the Soviets have claimed that high pressure water injection into wells has increased recoverable oil to the 50 percent level. The average recovery rate of U.S. wells (only 32-33 percent) despite great improvements in technology and equipment in recent years seems to indicate the Soviets are overly optimistic. Water flooding techniques have been used since the initiation of production in most USSR fields. The long term effect appears to be that the large volumes of water that have been injected at high pressure damaged reservoirs. Water injection yields high production rates in the early years of an oil field. As the field gets older, though, injected water breaks through the oil bearing rock into the producing wells. When this occurs, new wells must be drilled to locate the oil, or expensive pumps must be installed to lift the oil and water mixture to the surface.⁶³

By Soviet accounts, 50 percent of their 1955 oil production was by water injection. In 1960, they reported 60 percent and more than 80 percent in 1976 using the water injection technique. By the mid-1960s, water recovery began to rise substantially and the use of pumps became necessary. In the late 1960s, oil output began to drop off in Bashkir and show signs of decline in other parts of the Urals-Volga. The USSR

imported 1000 high-capacity electric submersible pumps from the United States. These pumps stabilized oil production in the Urals-Volga. The CIA estimates that unless additional fluid lifting capacity is obtained output will decline.⁶⁴ The Soviet inventory of submersible pumps as of 1 January 1975 was said to be 11,950; of these, 8,700 were in service, the remainder were undergoing repair or were in reserve. The Soviet pumps are inferior to American pumps in capacity, reliability and maintainability. The United States has a maximum output of 30 pumps per month. With competing domestic demands, the Soviet may be unable to obtain the pumping capacity required. In Bashkir alone, it will be necessary to install 470 to 500 pumps per year to maintain output.⁶⁵

Samotlor is already showing signs of water cut. It took 18 years in the Urals-Volga region to reach the 10 percent water mark. In Samotlor, this amount of water was discovered in the total fluid produced within three years. The submersible pumps last up to a year without service in the Urals-Volga. In Samotlor, however, due to salt and silt pumped in the fluid, the pumps need to be replaced after only 60 days of operation.⁶⁶

The total impact of these practices on oil recovery before 1974 cannot be fully assessed due to limited data. After 1974 the CIA reports that several prominent Soviet leaders and reservoir experts admitted that many mistakes were made on numerous fields. How much of a decline can be expected due

to this recovery method is uncertain.⁶⁷ Other errors besides water injection have compounded the recovery problem. Untreated water has led to excessive salt formation in well bores. Organic material in untreated surface water injected in hot oil reservoirs has caused prolific bacteria growth that reduces rock porosity.⁶⁸

Soviet industrial capacity is unable to produce the quantity or the quality of pumps needed to maintain oil level production. Between 1971-76, Soviet orders for Western oil and gas equipment have totaled about 3.1 billion dollars. An additional 4 billion dollars of steel pipe has been bought.

Oil exploration is also hampered by inadequate geophysical and drilling equipment only partly compensated by imported Western equipment. The average depth of exploratory drilling was increased from 2,540 meters in 1970, to an average of 3,180 meters in 1980. At these greater depths and pressures, Soviet drill bits proved to be inadequate. The USSR manufactures an estimated 1 million rock bits annually, compared with only 400,000 manufactured in the entire Western world. The quality is grossly inferior to those produced in the United States.⁶⁹ Instrumentation and exploratory equipment are largely obsolete. Seismic recording is often still done on analog tapes which cannot read beyond 2000 meters. In mid-1977, the Soviets admitted that the search for oil deposits in West Siberia was proceeding blindly because of inadequate exploration equipment.⁷⁰

With continued emphasis being placed on development drilling to meet short term oil production goals it is difficult to see how the Soviets can keep up oil production growth. The volume of exploratory drilling has stagnated since 1965 while the wildcat success rate has declined. In 1970, when the oil ministry drilled 29.53 million feet of hole, 9.29 million feet, or 31.5 percent was exploratory. By 1975 only 8.97 million feet of a total of 38.39 million was exploratory.⁷¹ This trend is continuing. The oil ministry's 1980 results show about 8.66 million feet of exploratory drilling, or 13.3 percent of the 64.96 million feet of total hole.⁷²

Without the consideration of an end to Western technological help, numerous assessments of the Soviet oil balance in 1985 are available. Table 2-12 gives nine different predictions at this 1985 time frame, which is the longest span which predictions can be made with any degree of accuracy. They are interesting in a number of respects: the U.S. government predictions of production are below the rest. The U.S. academics come next with a low scenario of just over 600 million T/Y while European academic sources are suggesting production levels up to and exceeding 700 million T/Y. If the past performance of the official Soviet plan is any indication of future performance then the CIA figures may be the nearest to fact.

Soviet consumption is also quite difficult to estimate. Official figures are apparent consumption, or gross production

Table 2-12
Soviet Oil Balance, 1985
(in millions of tons)

<u>Production</u>	<u>Consumption</u>	<u>Imports</u>	<u>Exports</u>	<u>Net exports</u>
1. 750 (650-670)	(580-580)			(100)
2. 655 (605)	545 (515)			100 (90)
3. 580 (600)	505			75 ¹
4. 612-713	467-536		144-157	
5. 500-550	525	50	150	100
		(50-100)	175-225 ²	
7. 712.6 (630)	634.2 (603.5)			78.4 (26.6)
8. 680-700 ³				
650-680				
9. 700 plus				
10. 620-645				

¹To East Europe only.

²Soviet and East European imports: figures in parentheses are Soviet imports inferred by the author.

³Soviet estimates learned in discussions with oil industry officials.

Sources:

1. Jeremy Russel, *The Times*, July 27, 1977. Figures in parentheses are Russell's 1979 estimates.

2. Leslie Dienes in: Leslie Dienes and Theodore Shabad, "The Soviet Energy System," (John Wiley: Washington, D.C. 1979), table 53, p. 252, figures in parentheses are low estimates.

3. Robert E. Ebel, "Soviet Oil in the 1980's" (Washington, D.C., September 1977). Figure in parentheses is indicated by a more recent paper by the same author "Energy Demand in the Soviet Bloc and the PRC," June 1979.

4. Hebert L. Sawyer, "The Soviet Energy Sector: Problems and Prospects," Harvard, January 1978 quoted in "Energy Projections--Oil, Natural Gas and Coal in the U.S.S.R. and Eastern Europe," Energy Policy, George W. Hoffman, pp. 232-241.

5. Harry G. Trend, "The Key to East European Economic Development," Radio Free Europe Research RAD Background Report 93 (Eastern Europe), May 12, 1978, cited in Hoffman loc cit.

6. CIA

7. "Situation et Perspectives du Bilan Energetique des Pays de L'est," Le Courier des Pays de L'Est, No. 216, March 1978. Median case cited in parentheses in low case.

8. "La Production Petroliere Sovietique a L'Horizon 1985, Approche Regionale," Centre D'Etudes Prrospectives et D'Informations Internationales, May 1979.

9. "Energy Supplies and Reserves in the ECE Region: Present Situation and Perspectives," Economic Commission to Europe, United Nations, New York 1979, p. 19.

10. Official Soviet 5-year plan target.

minus net trade. This is a good yard stick for approximate use; nonetheless, it cannot answer the critical question what figure is optimum at any particular time, rather than what the priorities of the planners are.

In a study by Leslie Dienes, he concluded that the optimum rate of consumption would be 1:1 to economic growth. With anything less than that, severe economic dislocation would occur.⁷³ If one assumes a 3½ percent growth rate with a working 1978 apparent oil consumption figure of 421 million tons, oil consumption for 1985 would be around 535-540 million tons or about what the CIA predicts production will be. If a slower 2 percent growth rate occurs then consumption would be around 500 million tons. A surplus could be anywhere from 0 to 100 million tons conservatively.⁷⁴

To understand what planned output conditions and historic consumption figures would mean to the Soviet economy, East European energy consumption for 1985 must be estimated. Figures generated in a study by Jonathan P. Stern for the Joint Economic Committee concluded that total Eastern European consumption in 1985 would be from a high of 159 million tons to a low of 127 million tons. This would mean a deficit over Soviet exports between 42-59 million tons using rather liberal Soviet export figures.⁷⁵ Further in the report he concluded concerning the ability of Eastern European countries to purchase that amount of oil:

"The lack of hard currency earnings potential in Eastern Europe has meant that those countries have little chance of purchasing anything other than marginal quantities of oil on the world market. Current levels of indebtedness virtually rule out any possibility of Eastern Europe being able to borrow funds in the West in order to finance hard currency oil purchases. East European countries are therefore looking for some non-commercial terms. From the standpoint of the producer, these countries are offering products and expertise inferior to that which can be purchased in the West and therefore, there needs to be some non-commercial rationale for oil producers to enter trade with them."⁷⁶

It therefore can be concluded that with optimistic figures the Soviet Union will be in a difficult situation in 1985 in regards to both Eastern Europe and hard currency earnings. If a Soviet invasion of Poland occurred this situation would be greatly intensified and it is not easy to imagine a workable solution to such a predicament. It could be thus assumed that the oil production problem alone is a powerful restraint on Soviet actions.

Conservation and alternate energy sources have been pointed to by some as a solution to the Soviet energy problem. A closer look at these areas shows perhaps a bright future in the long term but only marginal relief can be provided in the short.

By any standards the Soviets possess massive gas reserves. The proven reserve total stands at some 28 trillion cubic meters or 1/3 of the world total. Ultimately, recoverable resources amounting to many times that figure have been identified offshore, in inaccessible regions and the Far East.⁷⁷

In the twenty-five years up to 1975, the Soviet gas industry proved a great disappointment to the planners who failed

to see a single goal met. The center of production was moving into increasingly harsh physical terrain which called for techniques of production that were more sophisticated than available. It was not until the late 1970s, with the introduction of large diameter imported pipe and foreign built compressor stations, that the essentials of greatly increased gas production became available. Since 1975 every target has been exceeded and annual production has topped 535 BCM (billion cubic metres) in 1980. Predictions of Soviet natural gas production in 1985 range from 560 to 750 BCM with exports ranging from 55 to 180 BCMs. The crucial factor for gas is the equipment which the USSR imports from the West in the form of pipe and compressors.

If all the excess gas from the Soviet Union was exported to the Eastern bloc nations, which presently looks unlikely, there would still be considerable energy deficit by 1985. Nevertheless, gas can be considered an important energy source to both Eastern Europe and the Soviet Union which should increase in consumption much faster than the GNP.⁷⁸

The Soviet coal industry performance was a significant disappointment to the Soviets, falling in production for two, and possibly three consecutive years. The Soviet Union has prospectively enormous reserves of coal. Figures of around 240 billion tons are commonly expressed, with ultimately recoverable figures as high as 6 trillion tons. Nevertheless, after production rose by a total of just 13 million tons in

the first two years of the plan (76-78) totals fell to 719 million tons in 1979 and fell again to 716 million tons in 1980; a figure below that which was produced in 1977.⁷⁹

The Soviet coal industry has run into serious problems with investment, an overload of the transportation industry and a rapid deterioration of mine conditions, primarily associated with depth and thickness of seams.⁸⁰ The Soviet coal produced was largely of poor grade having a low calorific content. The prospects for the future are dimmer than previously thought; new fields that have been discovered east of the Urals are almost entirely made up of what is known as sub-bituminous coal with a heat content of a low 4 million kilocalories per ton. Difficulties arise with this coal because of its tendency to ignite spontaneously and thus it cannot be transported long distances.

Coal is an accurate representation of the Soviet raw materials problem as a whole. As with most Soviet natural resources, the geographic imbalance between centers of consumption and production is acute. With coal the problem is probably even more major than with other fuels. The Western high quality deposits principally from the Don basin are beginning to deplete rapidly. Because of the nature of the sub-bituminous coal of the east the only economic utilization of it is through the long distance transmission of power from generating facilities at the local fields. To this end the Soviets have demonstrated some success with a 40 billion KWH

annual rate power line from Ekibastuz to Kumbov. However, the ultimate goal of 100 billion KWH is still a considerable way from realization.⁸¹

Information on the civilian nuclear power program is sparse. The industry has suffered from many significant problems concerning technology and equipment of such magnitude that it would have doomed the American industry if similar problems had occurred; most notably the bad accident in 1957.

The energy problem in the Soviet has increased the priority of nuclear power. Nevertheless, nuclear power cannot really become important until 1990s and probably not until the next century. The targets for 1985 call for 50 billion KWH or 2.7 percent of Soviet energy production produced by nuclear power. By the year 2000 no more than 7.7 percent of Soviet energy is expected to come from a nuclear source.⁸²

Conservation has been emphasized by Gosplan for the past four to five years. First high level indication of the success of such measures was during the November 1978 plenum where Brezhnev admitted that after a spending of 50 billion rubles on conservation efforts no important energy saving had been made.⁸³ In a study done by Leslie Dienes published in June 1981, concluded that the Soviet system is less able than western nations to check the increase of energy demand by decoupling it from economic growth.⁸⁴ He pointed that irregardless of intense conservation efforts in the late seventies, on an average, the rise of gross energy demand and that of growth was at best one to one, and probably worse.

A CIA study indicated that the substitution of fuels had resulted in some oil savings. However, 54 percent of Soviet oil is consumed in internal combustion engines and large scale conversion can come only very slowly.⁸⁵

With only one vehicle for 40 inhabitants, compared with more than one for every two inhabitants in the United States, gasoline consumption is proving to be a difficult area to economize. The other significant segments of Soviet consumption include heat production, electricity generation and fuel transport which have been extremely reluctant to respond to campaigns for conservation. To realize large gains in energy reduction in these areas would require significant capital and time, both of these commodities in short supply.

On the balance, the Soviet Union will be a net exporter of energy for the foreseeable future. A great part of its performance rests on the Soviet Union's access to Western technology and equipment. The most favorable scenario for Soviet energy production is portrayed on the following page. Notable is the contraction of the Soviet energy surplus by 16-38 million tons of standard fuel during the period. Another notable feature is the large increase of the percent of natural gas in the balance. As Dienes suggests, "Natural gas is the ace in the Soviet energy plans and provides a critical cushion for the uncertainties faced by planners with respect to other sources of supply."⁸⁶

The Soviet energy picture for domestic consumption is bright and will be able to maintain a net energy export in

1985 of 230-250 million tons of standard fuel.⁸⁸ Domestic consumption is only part of the picture, however. The Soviet Union still must also supply other countries, mostly Eastern Europe, Vietnam and Cuba if their economic life is to be prolonged. Even with complete Soviet Union support these countries will still require between 42 to 59 million tons of additional oil per year by 1985 and it would mean the total loss of oil as a hard currency earner for the Soviet Union. If the Eastern European countries are unable to enter the world oil market the question then arises at what level may economic growth rates fall before provoking social unrest. This question could become pertinent much sooner if the Soviets were to invade Poland.

TABLE 2-13⁸⁷

Soviet Energy Balance 1980-85¹

	1980			1985		
	<u>Production</u>	<u>Consumption</u>	<u>Surplus</u>	<u>Production</u>	<u>Consumption</u>	<u>Surplus</u>
Oil	603(862.3)	473(676.4)	130(185.9)	650(928.5)	550(786.5)	100(143.0)
				605(865.2)	520(743.6)	85(121.6)
Gas	436(517.7)	380(452.2)	55(65.5)	610(725.9)	535(636.7)	75(89.2)
Coal	<u>716(501.2)</u>	<u>691(483.7)</u>	<u>25(17.5)</u>	<u>800(560.0)</u>	<u>770(539.0)</u>	<u>30(21.0)</u>
Total	(1,881.2)	(1,612.3)	(268.9)	(2,215.4) ² (2,151.1) ³	(1,962.2) ² (1,919.3) ³	(253.2)

¹Oil and coal in million tons, gas in billion cubic meters. Figures in parentheses are standard fuel equivalent converted at: Oil, 1 ton = 1.43 tonnage of standard fuel equivalent; gas 1 billion cubic meter = 1.19 tonnage of standard fuel equivalent; and coal, 1 ton = 0.7 tonnage of standard fuel equivalent.

²High oil production.

³Low oil production.

C. SOVIET AGRICULTURE

Agriculture is the weakest and least productive sector of the Soviet economy with a performance characterized by low labor productivity and extremely high cost of production. Moreover, despite gains in agricultural growth, which was overall greater than that of the United States for a period of nearly three decades, the U.S.S.R. has failed to produce the quantity and quality of products necessary to meet domestic demand.⁸⁹ As a result, the Soviet Union has become one of the world's major importers of farm products. During the mid-1970s, grain imports by the Soviet Union averaged 9 million tons a year; by the end of the decade, they had climbed to some 20 million tons a year. The Soviet planned imports for 1980 consisted of 34 million tons - the largest amount in the history of any country.⁹⁰ It is quite apparent that the Soviet Union would be severely affected by any effective embargo of agricultural goods initiated by the West for a Soviet invasion of Poland.

The Soviet agricultural industry presents one of the major paradoxes of the Soviet planning system and exposes some of the contradictions of the Soviet economy in general. On the one hand, total direct farm investment in the Soviet Union has run 6.3 times the value of investment in the United States for the past decade. On the other agricultural productivity growth has been extremely erratic, declining .4 percent during the 1971-75 time period.⁹¹ This widening gap in productivity is surprising in light of the enormous agricultural investment that the U.S.S.R.

continues to pump into the area. In 1977, for example, Soviet farm investment was equivalent to about \$78 billion compared with U.S. investment of roughly \$10.5 billion. Nevertheless, labor productivity, the value of farm output per man-day in the U.S.S.R., fell from roughly 7 percent of the U.S. level in the mid-1960s to 5½ percent in the mid-1970s.⁹² Overall, the agricultural sector receives more than one-fourth of the Soviet Union's investment resources, employs one-fourth of the labor force, but only produces one-sixth of the GNP.⁹³

The Soviet agricultural problem can be distilled into two distinct parts, with each compounding the other. The Soviets have severe environmental limitations, climatically comparable to the Prairie Provinces of Canada, and a system of management and production that is close to being the worst imaginable. Agriculture in the U.S.S.R. is handicapped by low rainfall and a short growing season, but it still has more crop land than any other country. Furthermore, in a study completed by Dr. Johnson, at the University of Chicago, he found that the characteristic climate conditions in nine-tenths of the Soviet grain area roughly correspond with those selected locations in six states and the three Prairie Provinces of Canada -- North and South Dakota, Nebraska, Montana, Wyoming, Minnesota, Saskatchewan, Alberta, and Manitoba. The only real difference is that of precipitation. In the North American continent, the areas similar in climate and soil to Soviet farm land receive a very large proportion of annual precipitation during

the growing season. In many of the major Soviet grain growing areas, less than half the annual precipitation occurs during this season.⁹⁴

Climate might explain why the Soviet Union is not the leading food exporter, but it is not a sufficient total explanation of why it cannot feed its domestic population. Japan, for example, is also poorly endowed with agricultural resources, yet with 3 million hectares of land in grain, it manages to satisfy the needs of its 110 million people for rice, and has some left over for export. The Soviet Union, with 260 million people, has 122 million hectares in grain. Put another way, in the Soviet Union one acre of farm land is unable to feed two people, while in Japan more than 36 people are fed by an equal area.⁹⁵

The history of Soviet agriculture prior to Khrushchev was written in blood. Agriculture policy was a blend of extreme pressure, impatience, of stubborn optimism, and of willful ignorance. By the time of Stalin's death the condition of agriculture was deplorable. The prevalent belief being that agriculture could be set in the right direction without a major restructuring, or a permanent increase in agriculture's share of the investment budget.⁹⁶ Khrushchev shared this view, but unlike Stalin, Khrushchev had a passionate interest in agriculture. Over the years there was little he did not try, except probably what was truly needed. Many of the traits Khrushchev is remembered best for come from his endless schemes

for the farm land: his passion for the spectacular gamble, his constant and frantic reorganizations, his lust for miracle crops and his finally fatal habit of taking the turns in the weather as a vindication of his policies.⁹⁷

Khrushchev's effort to increase agricultural production was aimed at several fronts, including:

- (1) Programs for rapid expansion of crop areas;
- (2) Partial decentralization of planning and management;
- (3) Higher prices and other measures to provide peasant incentives; and
- (4) Modest increases of production capital.⁹⁸

The opening of the "virgin lands" east of the Volga River in Siberia and Kazakhstan resulted in an increase of total sown areas of more than a fifth from 1953-1956. The average output of these semi arid-farm lands was 13.6 million tons with an area peaking in the early 1960s of 63 million hectares. A major result of this expansion of farm land was a shift to corn and livestock in the traditional farm areas, while the virgin lands, not well suited for corn production, picked up the slack with grain production.⁹⁹

The area of expansion required considerable increases of investment and drew heavily on the rural labor force. As investment increased for the virgin lands much of the rest of Soviet agriculture became investment starved, especially the non-black-earth zone in the northern half of the European U.S.S.R. The virgin lands themselves were poorly managed. The policies of the Kremlin drove soil fertility steadily

downward, leading eventually to the disastrous crop failure of 1963. Constant pressure from above to maintain increasingly longer areas under cultivation led to weed problems, dust storms reaching as far as European Russia and declining yields.

Farm labor, discouraged by poor crop output migrated back to European Russia in great numbers. New arrivals, attracted at high cost, were trained in farming techniques ill suited to the dry soils of the virgin lands. Fedor Morgum, now First Secretary of the CPSU's Poltava Obkom, was head of the agriculture for the entire Tselinryy Kray in the virgin lands. Morgum claimed the poor results of Khrushchev's programs came from short-sightedness, agronomic stupidity, and willful disregard of facts due to the relentless political pressure of Moscow¹⁰⁰

The virgin lands, certainly not a shining success, nevertheless contributed substantially to the national food supply. The program had a one-time growth impact, however, which reached its major limits in the first few years, and it did not solve the basic problem of low productivity.

Food prices were increased in the late 1950s to improve farmer incentives. However, the standard of living never reached that of the urban dwellers and farm price increases were withheld again until 1962. On state farms, the total average profit became increasingly negative from 1958 through 1963. At the same time these negative agriculture traits were aggravated by a campaign against the private sector which

resulted in substantial reduction in land and livestock holdings and consequently, farmer incomes.

Investment also fell off with the completion of the virgin land campaign. Investments in collective farms actually declined and did not exceed 1958 levels until 1964. The investment which was provided apparently went into livestock holdings and more long-term land improvement programs. Growth in shorter term productive inputs, such as fertilizer, was quite moderate until 1963.

The programs of Khrushchev initially showed success and brought production to a new level. The lack of price increases and continued investment stopped farm output from continued rising. Few gains were made between 1959-63; in fact, average output was only 3 percent above the peak level of 1958.

The last and fatal experiments under Khrushchev concerned administrative reorganization, and campaigns. Khrushchev ordered a program to plow up fallow and grass lands and plant them with supposedly more productive crops. A record low fallow area coincided with extremely dry weather in 1963 to produce a major crop failure. Cattle and hogs were distress slaughtered and large grain imports were purchased from the West. In 1964, Khrushchev was ousted.¹⁰¹

The first major economic program of the post-Khrushchev leadership was in agriculture. Leonid Brezhnev, General Secretary of the Communist Party, led a remarkable shift of policy and resources. The March 1965 plenum on agriculture and the 23rd Party Congress in early 1966 included these reforms:

- (1) Reduced planned goals on State purchases of grains and livestock products with amounts fixed through 1970;
- (2) Increased State purchase prices to collective and State farms on grains and meat, which followed a previously announced increase on milk prices;
- (3) Premiums on prices of several commodities, including a 50 percent bonus on above-plan sales of grain, which later was followed by a 100 percent bonus to collective farms on above-average sales of sunflower seeds and a 50 percent bonus on above-average sales of cotton;
- (4) A considerable rise in the level of investments into agriculture, with particular emphasis on stepped-up deliveries of machinery;
- (5) Altered tax procedures to eliminate double taxation of collective farm labor payments;
- (6) Cancellation of long-term debts of weak collectives;
- (7) Elimination of price discrimination between rural and urban areas on consumer goods;
- (8) A planned doubling in supplies of mineral fertilizers used in agriculture by 1970 - but this was less than promised previously by Khrushchev;
- (9) A comprehensive land improvement program - irrigation, drainage, liming - which subsequently was discussed in greater detail at a special plenum of the Communist Party Central Committee in May 1966, but which largely was already envisaged in the investment goals previously announced;

(10) Stricter procurement contracts, specifying fines for failure to meet them, with especially severe penalties on procurement organizations which fail to accept delivery of perishable commodities;

(11) A program to greatly improve electrification in rural areas;

(12) Emphasis on the role of specialists and scientific farming principles, apparently in contrast to the Party and administrative bureaucracy; and

(13) A directive to improve housing and public amenities in rural areas.¹⁰²

Table 2-14 shows the sharp turn around of investment under Brezhnev's leadership. Further efforts of Brezhnev toward agriculture can be characterized primarily by higher prices and incomes, greater leeway and certainty of farms and farmers in their planning, and greater use of profits and cash incentives to stimulate agricultural performance. Gross agricultural output during 1966-70 gained 21 percent and grain production was up 29 percent. Livestock performance was improved; meat and milk output was up 25 percent. These gains far exceeded performance during the Khrushchev years. Some of the performance, no doubt can be attributed to the more favorable weather during 1966-70.

For the 1970s, the fundamental element of Soviet agricultural goals was a strong commitment to a rapid increase of livestock production and thereby to satisfy more fully the growth in consumer demand for livestock products. This

Table 2-14¹⁰³
Comparisons of Agricultural Investment, 1960, 1965, 1970-77¹
Dollar value--million 1976 dollars

	United States			U.S.S.R.			U.S.S.R. ruble value - million 1969 rubles		
	Total	Machinery	Construction	Total	Machinery	Construction	Total	Machinery	Construction
1960-----	5,482	3,533	1,949	16,604	9,359	6,687	5,741	2,136	3,605
1965-----	7,986	5,765	2,221	29,979	16,989	11,261	9,980	3,909	6,071
1970-----	8,757	6,383	2,374	43,986	21,293	18,927	15,092	4,889	10,203
1971-----	8,254	5,984	2,271	50,564	24,542	21,756	17,347	5,619	11,728
1972-----	8,520	6,544	1,976	55,636	25,031	24,580	19,041	5,790	13,251
1973-----	11,512	8,801	2,711	61,601	28,542	26,710	20,994	6,595	14,399
1974-----	11,773	8,891	2,882	66,776	31,083	29,038	22,825	7,171	15,654
1975-----	10,782	8,343	2,439	73,695	34,882	31,105	24,813	8,044	16,769
1976-----	10,743	8,120	2,623	76,683	37,498	32,177	25,904	8,558	17,346
1977-----	10,573	7,877	2,696	78,430	38,203	33,210	26,737	8,834	17,903
Total									
1970-77---	80,914	60,942	19,972	507,250	240,965	217,504	172,753	55,500	117,253

¹For comparative purposes, the use of the international exchange rate between rubles and dollars is deficient. Rather, ruble values for Soviet agricultural investment have been converted to dollar values by use of purchasing power parities (ruble-dollar ratios) for the machinery and construction components. Price ratios constructed for individual types of machinery and buildings and structures are aggregated into category ratios. Ruble-dollar ratios for (a) agricultural machinery and equipment are taken from a forthcoming CIA study that compares United States and Soviet machinery prices; (b) for construction, an updating of the 1970 ruble-1970 dollar ratios in CIA ER-76-10068, "Ruble-Dollar Ratios for Construction," February 1976.

commitment included the use of imports of grain to help cover shortfalls in livestock output and to the uncharacteristic acceptance of external debts to make possible such imports.

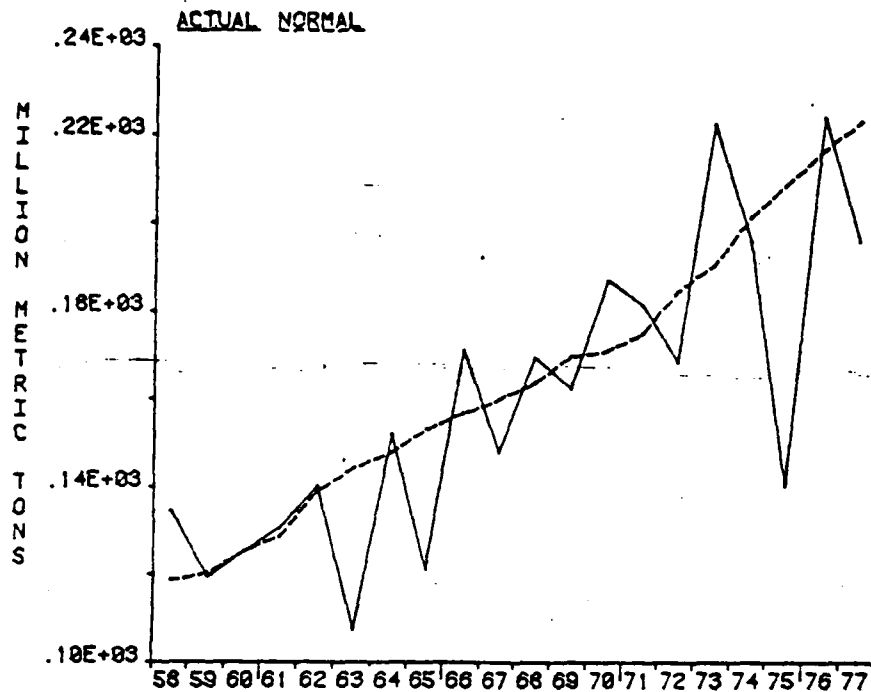
Favorable pre-conditions for the livestock program were established by increased prices on poultry and livestock in the 1969-1970 time frame. Key price changes included (1) Establishment of 50-percent premiums on above-plan sales of livestock products; (2) the fixing of livestock prices at premium levels; (3) establishment of additional price premiums of 35 to 50 percent on young cattle fattened beyond specific weights; (4) price increases of 20 percent on milk and cream; and (5) price increases of 20 to 30 percent on several grades of wool, as well as increases on sheep and goats.¹⁰⁴

The critical element of the livestock program was the need to expand feed production. The plan called for a 40 percent jump in feed supplies from 1970-1975. Foremost among the requirements to expand feed was the need to increase fertilizer deliveries. Fertilizer deliveries jumped 69 percent from 1965 to 1970 and another 65 percent from 1970-1975.¹⁰⁵

Despite the increases in fertilizer and a massive program of irrigation and drainage, the 1970s production of feed were far more ambitious than could be attained in the course of a few years. The weak link in the livestock program turned out to be feed supply. Though feed supplies rose dramatically in the 1970s, as shown in Table 2-15, they did not provide enough even in good weather years, and there was a considerably greater deficit in years of poor weather.

Table 2-15¹⁰⁶

Total Grain: Normal and Actual Output

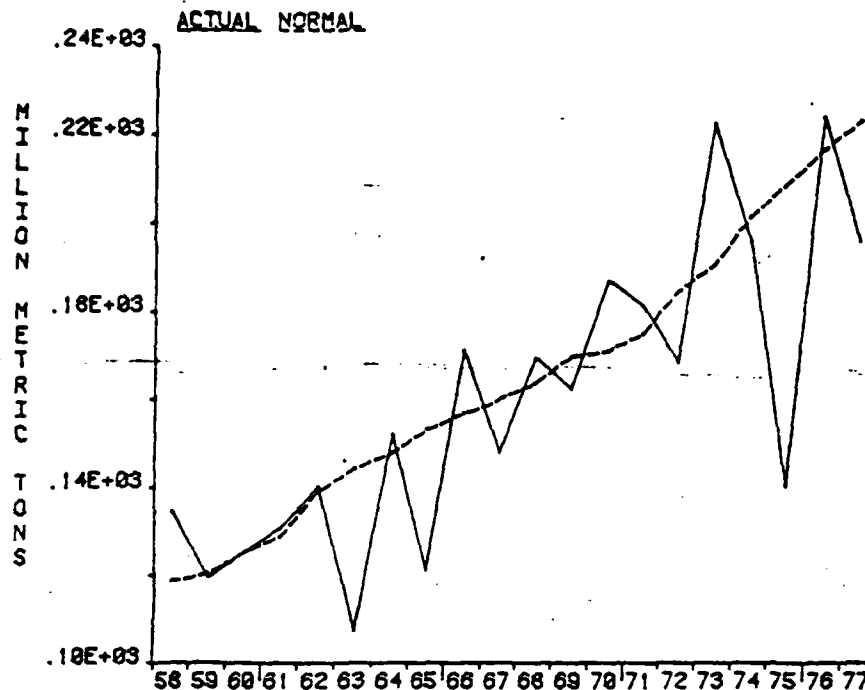


Prior to 1971 the U.S.S.R. had imported grain in relatively small quantities, except following the poor 1963 and 1965 crops. Imports of grain began to rise in 1971 leading to massive imports of more than 20 million tons in 1972. Average imports for 1971-75 reached 15 million tons per year, exceeding 20 million tons in 1975. Averaging 20 million tons for 1975-80 culminating with 34 million tons in 1980.¹⁰⁷

When looking at overall growth figures, Soviet agriculture shows impressive performance. However, when productivity is compared with other industrial countries, most notably the United States, Soviet performance appears less commendable. (see Table 2-16)

Table 2-15¹⁰⁶

Total Grain: Normal and Actual Output

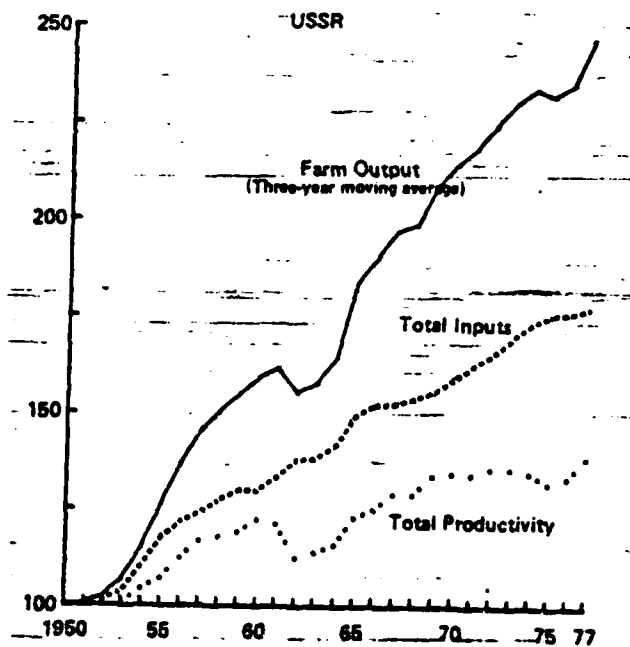
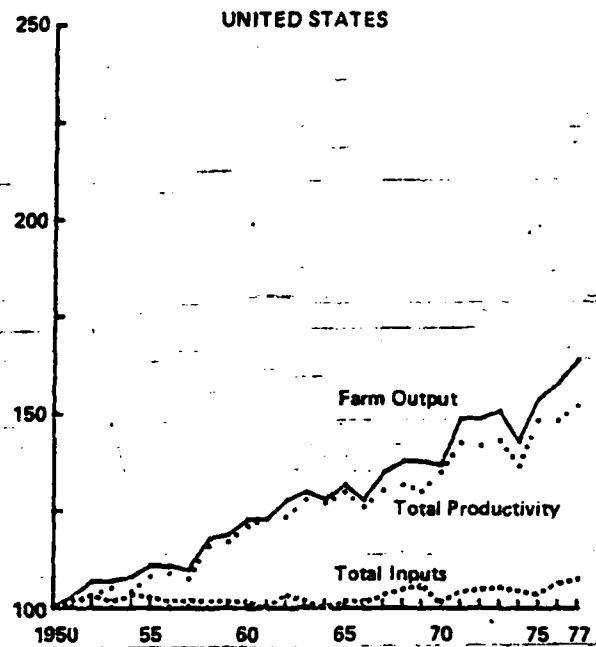


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Table 2-16¹⁰⁸

Farm Output, Inputs, and Total Productivity
Index 1950=100



The problems that face Soviet agriculture that the leadership has yet been unable to solve are similar to the problems of the Soviet economy as a whole. Centrally planned economies like the Soviet Union do not lack for well thought out and advisable initiatives. Where system failings become apparent is in the implementation of these plans in a timely and workable manner. Enormous bureaucracies, by their very nature, hinder innovation, are inefficient and slow moving, and are extremely reluctant to share power. The Soviet bureaucracy is considerably more prone to these problems.

Many new construction projects are ill planned, the technical requirements for agriculture often are poorly estimated, and hence, as Brezhnev noted in July 1979, more material funds are used than planned. Poor design and inadequate maintenance leads to retirement rates of farm machinery at an incredible pace. Table 2-17 shows that some farm equipment is scrapped at nearly 20 percent per year, which is the highest among the world industrial countries.

Continued limited control of farm managers has led to severe lags in the introduction of modern crop varieties, in the adoption of suitable methods of applying fertilizer and other chemicals, and in the selection of suitable methods of proper tillage and harvesting practices. Farm chairmen constantly complain of interference. Repeatedly the managers state that they have been given precise plans for sowing particular areas, even if these plans contradict existing crop

Table 2-17¹⁰⁹
Agricultural Machinery, Inventories, Deliveries and Scrapping Rates (thousands)¹

	Tractors			Grain Combines			Tractor Plows			Cotton Harvesters			Windrowers			Trucks		
	Inventories	Deliveries	Scrapping Rate	Inventories	Deliveries	Scrapping Rate	Inventories	Deliveries	Scrapping Rate	Inventories	Deliveries	Scrapping Rate	Inventories	Deliveries	Scrapping Rate	Inventories	Deliveries	Scrapping Rate
1966-70																		
average	1,748	293	12.6	558	94	12.8	934	193	NA	NA	6	NA	376	56	18.6	1,061 ⁵	144	NA
1971	1,977	313	12.3	623	99	13.3	941	217	23.0	39	7	15.4	335	51	17.6	1,136	169	12.1
1972	2,046	313	11.6	639	93	11.9	942	219	22.1	40	7	17.5	327	59	16.8	1,168	187	10.5
1973	2,122	323	12.1	656	82	12.2	953	215	21.7	40	7	12.5	331	63	17.2	1,232	224	14.6
1974	2,188	348	12.3	658	83	10.3	961	203	19.9	42	7	14.3	337	83	16.9	1,276	250	14.9
1975	2,267	370	13.3	673	92	12.6	973	191	20.1	43	8	16.3	363	92	19.8	1,336	269	15.6
1971-75																		
average	2,120	333	12.3	650	90	12.1	954	209	21.4	41	7	15.2	339	70	17.7	1,230	220	13.5
1976	2,136	369	13.0	680	98	13.7	968	185	13.4	44	8	15.9	383	92	18.5	1,396	269	17.9
1977	3,402	365	12.7	685	101	13.6	1,023	176	NA	45	9	13.3	404	NA	NA	1,442	268	14.5
1978	2,462	371	NA	693	111	15.0	NA	NA	NA	48	9	NA	NA	NA	NA	1,501	259	NA
1979	NA	354	NA	NA	112	NA	NA	NA	NA	NA	9	NA	NA	NA	NA	NA	266	NA
1976-80 plan																		
average	NA	380	NA	NA	108	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	270	NA

¹ Inventories are for the beginning of the year. The scrapping rate equals deliveries minus the change in inventories divided by inventories at the beginning of the year. The Soviets have high machinery scrapping rates. The service life of machinery may be found by dividing the scrapping rate into 100 percent. Based on the 1971-75 average, the service life of tractors and grain combines is about eight years, of trucks and cotton harvesters is approximately seven, of windrowers is six, and of tractor plows is nearly five years. ² Excluding non-farm trucks of inter-farm associations and excluding tank trucks. ³ Including specialized vehicles. ⁴ Non-specified. ⁵ Including tank trucks. ⁶ Including inter-farm associations and excluding tank trucks. ⁷ USSR Agricultural Situation: Review of 1977 and Outlook for 1978 (1978), 24-25; Investia (20 Jan 1979) (26 Jan 1980). The scrapping rates for grain combines were calculated incorrectly in the USSR Agricultural Situation report for 1977-78, p. 25. Michael D. Zahn, US Department of Agriculture, has provided the revised rates used here. In 1977 the planting of vegetables was 57 percent mechanized, the stacking of hay was 77 percent, the harvesting of potatoes was 43 percent and loading of potatoes 55 percent, and the harvesting of cotton was only 53 percent mechanized. Complex mechanization accounted for 33 percent of cattle-raising, 58 percent of pig-raising, and 62 percent of poultry-raising. Vestnik sel'khozhoziaistvennoi nauki (Jan 1979), 16-17.

rotation schemes. Some of the produce not included in the plan cannot be disposed of because the procurement organizations refuse to accept it. Little financial autonomy is allowed, leading to the acquisition of unwanted deliveries of unsuitable equipment.¹¹⁰

Economics of scale is a further problem of Soviet agriculture, especially in the livestock complexes. Table 2-18 suggests the immense size of Soviet "producer's cooperatives." Some Soviet experts have argued for smaller farms. However, others feel the problems of such a move would outnumber the benefits.

The Soviet leadership has transformed the inefficient labor-intensive, crop producing agricultural sector of the past into a labor-intensive, capital-intensive industry at enormous expense and less rewards than the Soviets had expected. Nevertheless, the overall strategy for continued growth appears to rest on reclamation, chemicalization, and mechanization. Special attention is being directed to so-called zones of guaranteed moisture, such as the Russian Nonchernozem Zone.

The prospects for future food self sufficiency center on the Soviet leadership's ability to promote break-throughs in agrotechnology that will support greater grain output as well as efficiencies in production and continued ability to expend growing amounts of capital. Recent performance shows only limited success on both counts. Capital investment has begun to slow down and in some areas actually decline. Farm receipts of tractors was down 4 percent from 1978 levels in 1979.

Table 2-18¹¹¹Selected Characteristics of Average United States and Soviet Farms, 1977¹

	United States ²	U.S.S.R.	
		State	Collective
Number of farms	2,706,450	20,066	27,700
Agricultural land (hectares) (per farm)	160	17,800	6,600
Number of workers (annual average) (per farm)	1.5	588	539
Cattle (per farm)	NA	1,899	1,768
Hogs (per farm)	NA	1,082	1,030
Gross receipts per farm (1973 prices)	\$ 34,730 ³	\$777,402 ⁴	\$634,545 ⁴

¹Although it would be more meaningful to provide a distribution by size, comparable data for each country are not available. Similarly, data for an overall average of small private holdings of Soviet households are not available.

²For comparison purposes, the changing structure and wide diversity of U.S. agriculture complicate the problem of defining an "average U.S. farm." The proliferation of integrated operations, and the trends toward specialization and increased capitalization of U.S. agriculture have created vast differences among farms in terms of physical size, asset values, and marketings. For instance in 1977, farms with sales of \$200,000 or more, although accounting for only 2 percent of all farms, had more than 35 percent of total cash receipts. Correspondingly, farms with sales of less than \$20,000, accounted for only 10 percent of total cash receipts while comprising 70 percent of all farms. A large proportion of these farm operators relied on "off farm" sources of income to supplement farm income.

³Gross receipts from farm marketings, not including Government payments or value of products consumed in farm households.

⁴Gross receipts from marketings by state and collective farms. For 1977, only gross output values are available. These were reduced by using the average ratio of gross sales to gross production for 1966-70, the most recent years for which both series are available. The constancy of the ratio for those years (55 to 56 percent) provides some assurance that the degree of error in the above estimates is low. Ruble values were converted to dollars using the ruble/dollar ratio derived by inflating 1977 USSR total farm output valued in 1968 rubles and 1957-59 dollars to 1973 ruble and dollar prices.

Sources: U.S. data from Agricultural Statistics 1978 and Farm Income Statistics, ESCS, U.S. Department of Agriculture, Stat. Bul. No. 609, p. 55. U.S.S.R. data calculated from statistics in Narodnoye khozyaystvo S.S.R. v 1977 godu, Moscow, 1978, pp. 271 and 288 (hereafter Narkhoz and the appropriate year). Sales as a share of gross ruble output from Sel'skoye khozyaystvo S.S.S.R., Moscow, 1971, pp. 44, 52.

Fertilizer was also down 3 percent, while overall investment in agriculture grew just 2 percent in 1979 from 4 percent in 1978 and 10 percent in 1971-75.¹¹²

Consequently, the future of Soviet agriculture looks very much like the past, a mixture of success and failure. The current plans have had some success in raising the general level of agricultural production. Unless radical organizational changes are instituted or increased levels of investment are expended, however, continued progress is likely to be harder and less effective than past efforts. The slower growth of capital investment places more emphasis on the efficient use of the resources, an area in which the present regime has largely failed. The Brezhnev leadership has failed to stop or even dampen the year-to-year fluctuations in output. This scenario seems likely to continue. In some years the supply of grain will be nearly sufficient for livestock herds. In most years it will be grossly inefficient to the extent that the Soviets persist in their commitments to the consumer, and thus grain will have to be imported. In the upcoming years, greater and greater resources will be needed to keep consumers adequately supplied with agricultural commodities.

The willingness of Soviet citizens to accept reductions in foodstuffs can only be guessed at. For the past few years, however, reports have filtered out of the Soviet Union of unrest and labor protests. There has been reports of a walkout at the giant automotive manufacturing complexes at Burki and Togliatti in the Volga Basin involving large numbers of workers.

Work stoppages are said to have occurred at a tractor factor in the Ural Mountain City of Chelyabinsk, and a shutdown of the giant Kolmy River truck plant in Noberezhnite. In every instance, the reason was said to be a growing dissatisfaction over supplies of food.¹¹³

If the Soviets invade Poland, the flow of grain imports could be cut off completely. A more probable affect would be a sharp reduction of grain from NATO countries, with only partial compensatory supplies from other grain exporting nations. This would result in higher grain prices or a greatly reduced rate, at the minimum. Such a reduction in feed supplies would force distress slaughtering of livestock with a significant reduction in the meat supply. Considering the Polish problem was started to a large degree due to high meat prices, the Soviet leaders must keep this in mind when contemplating any action against Poland.

The agricultural prospects in the Soviet Union are only good if they continue to have the hard currency to buy Western grain, and the Western market remains open to them. A Polish invasion would have an effect on their ability to earn hard currency and buy grain. The resulting consequence of this on their own domestic stability is difficult to foresee. The Soviet system has many controls to stop labor outbursts, probably greater than any country in the world. Nevertheless, increased worker dissatisfaction can only have a negative effect on an already weak economy.

D. THE SOVIET SYSTEM AND CAPITAL INVESTMENT

There seems to be considerable agreement among American analysts, both governmental and private, that the Soviet economy will experience a rapid deceleration of growth in the 1980s. The causes of this, as previously discussed, are a growing labor shortage, continued and increasing energy problems, and an inefficient and costly agricultural system. However, the most significant problem of the Soviet economy is its basic organization. The Kremlin planner is faced with an economy that is manned by one of the world's most inefficient work forces, organized in a way that shortages and shoddy workmanship are the norm, and where the growth is, to a very large extent, the result of capital investment and labor, rather than productivity gains.

The so-called Soviet-type economy's growth momentum has been flagging. Policies and procedures that worked adequately in the 1950s and 1960s have yielded diminishing returns in the 1970s and now appear to face failure in the 1980s. The input increases that formerly underlay output growth are no longer available at the required level. The answer to the socialist dilemma seems to be: 1) undertake the necessary measures to increase productivity; 2) secure external financing; and 3) reconcile the country to lower growth rates and possible economic stagnation.

The Soviet leadership faced with sharply increased pressures to change, have attempted to "muddle" their way through

by incremental movement concerning the first two solutions which have resulted in the third. A large group of Soviet economists and virtually all Western specialists agree that small scale tinkering can no longer suffice and what needs to be done is radical system changes and continued use of Western capital and technology.

Major economic reform in the Soviet Union would be extremely difficult in the most favorable of circumstances. If the Western answer to a Soviet invasion of Poland was a cut-off of capital, and technology, such reform could trigger a profoundly destabilizing chain reaction that could undermine the political leadership in a fundamental manner.

When comparing the Soviet economic growth formula with that of the Western countries, the most distinctive feature of Soviet economic development is the emphasis on high rates of investment, in addition to labor as the fuel for growth. This type of development is often referred to as extensive. The Soviet Union since 1950 has relied on capital stock as 45 percent of the contribution to growth, compared to 27 percent in Japan, 18 percent in the industrial economies of northwestern Europe and 25 percent in the United States.¹¹⁴ Investment growth has been at such a rate that the Soviet Union is virtually the only major country in which over the long run, the quantity of capital has grown more rapidly than the GNP. The USSR capital expanded by 7.4 percent yearly during 1928-66 while the GNP grew 5.5 percent. In contrast, the United States' annual rate

of capital growth between 1929-57 was 1 percent while GNP grew at 3.0 percent.¹¹⁵

The problem of relying on capital and labor for major economic growth concerns the high cost of such a formula, and the continued necessity of a larger share of investment to maintain equivalent growth. The rate of investment has increased in the USSR since World War II. However, it has not increased sufficiently to continue the high GNP growth rate. In the period of 1951-60, investment going to capital stock expanded by 9.4 percent annually. From 1960-70, the rate increase slowed to 8.1 percent; from 1971-75 it further declined to 7.9 percent, while the last Five Year Plan the growth rate declined to less than 6 percent. Nevertheless, the Soviets still relied heavily on capital for growth and was the least reliant on productivity of any of the major economies. The reduction of investment growth is thereby considered one of the major reasons for the decline of GNP growth.¹¹⁶

Uncharacteristically the Soviets departed from previous plans by projecting a low investment growth rate of about 3 percent per year for the near term. The investment input stringency is caused not so much because of any change in basic philosophy, but rather the inability of the economy to satisfy the mounting claims of consumers, producers, and the armed forces with a slower expanding total output. With a forced less reliance on investment, greater stress must be placed on efficiency to produce the growth results projected. Hence

the emphasis which has appeared repeatedly in recent Brezhnev speeches on improving the return on investment. Implementation of investment plans remains extremely inefficient, with gestation periods often grossly excessive, and a strong tendency to escalation of costs.

The slowdown in investment reflects the Soviet's inability to divert additional segments of their GNP away from consumption or the military. In 1980 investment annual output comprised 28 percent of the GNP compared with just 16 percent in the United States. The 1976-80 plan called for a 1.4 productivity growth annually, while actual productivity declined 0.8 percent. (Refer to table 2-19)

Table 2-19¹¹⁷

USSR: GROWTH OF GROSS NATIONAL PRODUCT FACTOR INPUTS AND FACTOR PRODUCTIVITY

	Average Annual Percentage Change				
	<u>1961-70</u>	<u>1971-75</u>	<u>1976-77</u>	<u>1976-80 Plan</u>	<u>Actual</u>
GNP	5.2	3.8	4.1	5.0	3.1
Factor Inputs	4.3	4.2	3.6	3.5	3.6
Man-hours	1.8	1.7	1.3	1.5	1.3
Capital	8.1	7.9	7.2	6.5	7.0
Land	0.1	0.8	-0.1	0.5	0
Factor Productivity	0.9	-0.4	0.5	1.4	-0.8

The Soviet Union's inability to increase productivity is primarily due to system inefficiencies and a slow rate of technological progress. Although a major industrial power, the USSR continues to lag far behind in technology development and

implementation. Except in military production, where the best workers, managers and scientists in the Soviet system are assigned, Soviet manufactured products are generally poor in quality and often technologically inferior. Because of this, as well as the inability to provide spare parts, and services, the Soviet exports are almost entirely made up of raw, semi-processed materials and military hardware, a trade pattern unique among industrial nations.¹¹⁸

The Soviets have, in an attempt at remaining current, instituted a policy of massive West-East technology transfers. In a recent report by the Organization for Economic Cooperation and Development, entitled "Technology Transfer Between East and West," written by Eugene Zuleski and Helgard Wienert, it found that 49% of Soviet imports, on the average, were technology-intensive products. This is a rise of 3 percent from 1976-77. The major methods of technology transfers are cooperative research and development programs, turnkey arrangements, licensing contracts and barter. The biggest purchases in technology transfers are the turnkey arrangements. For example, deals that were being negotiated in 1978 like the \$1 billion to \$2 billion contract for pulp and paper plants, a \$3 billion contract for development of gas fields in Siberia, a \$2.8 billion petrochemical project, and a \$1 billion to \$2 billion iron and steel complex are of the turnkey type.¹¹⁹

"The Soviet Union's preference for turnkey plant purchases" says the report, "is clear from the fact that 90 out of 160 industrial cooperation agreements concluded West until 1975 were for the supply of turnkey plants."¹²⁰

This type of strategy is for example, a way for the Soviet's out-of-date chemical industry to leapfrog over the gap in a short period of years. The problem of such a strategy is that it makes the Soviet Union increasingly more dependent on Western technology for its economic health.

The Soviet lag in technology is confined not only to development, but to a slowness in assimilating purchased Western technology as well. In a study done by two British economists, Philip Hanson and Malcolm R. Hill, it was concluded that the Soviets take longer to absorb the technology, that there was no reduction in lead time with experience, and that subsequent manning levels tended to be on the high side, while output was on the low side.¹²¹

Once again we see that the problems with domestic generation of technology are not due to a lack of effort, but to deficiencies in the system. The Kremlin leaders have long since recognized the strong relationship between growth and technology. By 1965, the Soviets' efforts at research consisted of 2000 research institutes employing 2,497,000 people, including 765,000 professionals, 418,000 semi-professionals and 357,000 research and academic personnel.¹²² Soviet physicist Peter Kapitsa noted that the Russians have roughly as many scientists as the United States but that Soviet output is only about one-half that of the Americans.¹²³

The Soviets' inability to produce technology is only half the problem as previously noted. Slow diffusion of technology

has been the concern of planners for some time. A series of decrees have endeavored to improve performance of management, research and development and educational institutions in this vital area. In view of the slow progress thus far, it seems unreasonable to count on a break-through over the next several years.¹²⁴

The crux of the Soviet technology transfer and innovation problem is that the Soviet system of incentives is geared toward motivating management staffs to fulfill and exceed output plans. The surest way to avoid failure is by not risking the production slow down often associated with new products or processes. In a market economy, the firm that fails to innovate will lose sales to those that do. Soviet firms have a guaranteed market, therefore, are under no pressure to innovate.¹²⁵

Horror stories abound about the extreme inertia of the Soviet system. A typical illustration is that of Soviet industry which developed a system similar to our "zero defects" organization used in the U.S. aero-space industry. It took nearly 10 years for the innovative method to work its way up to the national level and to the initiation of a plan for adoption. A further example concerns a truck factory that turned out a certain model for 15 years without improving its deficient engine. The engine was prone to rapid wear and high repair costs. Though design improvements would have proved cost efficient, suggestions were rejected by the management because of initial expenditures. The management

was more concerned with cost performance indicators than with total efficiency.¹²⁶

A thorough reform of the economic system would boost appreciably the efficiency and quality of production over a period of a few years. Nevertheless, the Kremlin leaders perceive that reform would threaten vested interests and weaken its political control. The most radical reform conceivable would be a form of market socialism which includes a larger role for free enterprise, a system similar to that which the Chinese are presently proposing. This would both entail compromises with ideology and would replace bureaucrats, hence it will incur resistance. Moreover, the transition to a market economy could cause unemployment and severe disruption in the short run. Most analysts consider that unless a serious economic break down occurs, few changes in planning and organization will develop in the 1980s.¹²⁷

For all these reasons, it is easy to understand why one analyst has concluded:

"... a major economic reform would disturb the established balances in both political and economic power. It would be strongly opposed by the state bureaucracy whose jobs, careers and political influence would be at stake, as well as by the party bureaucracy, whose control over economic decision-making and resource allocation would be threatened. Faced with uncertain long-run benefits, probably high short-run costs, and certain strong opposition, a Soviet leadership of any foreseeable composition would probably opt against taking such risks."¹²⁸

The capital crisis is not only the result of normal system needs of an extensive economy, but of the unique affects of

year after year of poor planning. The lopsidedness of the Soviet economy is one of these unique features. Because the focus of Soviet development over the past half century has been on heavy industry, large cumulative deficiencies exist in the stock of residential capital, urban social overhead capital, and the facilities required to supply public and private social services. After 1957 a large effort was instituted for urban housing construction. Though large in absolute dimensions, it failed to produce quality and the required quantity of housing necessary. With the capital situation as tight as it is, urban housing shortages seem sure to persist.

Soviet growth policies over the last half century have also given inadequate attention to improvement in water supply, sanitary facilities and paved roads. There is an enormous and growing backlog of unmet demands for water mains, sewers, paved streets, and sidewalks.¹²⁹ The Soviet highway system is shockingly in contrast with the USSR's position as a global power. All these require large amounts of capital to solve.

In 1979, crude steel production declined 1.6 percent, chemical production declined 1.2 percent, cement production declined 3.2 percent while rail traffic stagnated. All these areas are capital starved, resulting in obsolete, inefficient plants and a rail system that is over taxed and deteriorating. Over the long run, transport problems in the USSR are likely to worsen unless investment in this sector is increased considerably.¹³⁰

The skyrocketing raw material costs is a new significant tax on scarce investment capital. Capital costs have been rising rapidly, particularly in mineral extraction industries as the result of the declining quality and quantity of easily accessible raw materials which have in turn required more reliance on costly and sophisticated recovery techniques. For example, the heat value of a ton of coal has declined 10 percent in the 1970s while its source of concentration has shifted eastward. The need to transport raw materials from more distant locations, where few or no transport facilities exist, has pushed up capital expenditures dramatically. According to the Soviet Chief of the Administration of Financing Heavy Industry, the cost of production of petroleum has increased by 150 percent since 1965, coal by 120 percent, lumber by 170 percent.¹³¹

If the productivity problem cannot be quickly overcome, one solution to the capital investment problem would be increasing investment by rearranging GNP output priorities. However, such a policy entails high costs. The GNP is divided roughly into three sections: consumption occupying 58 percent, investment 28 percent, and military spending 14 percent. In view of these proportions, consumption seems the most likely candidate for trimming in favor of investment. A 10 percent increase in investment would only reduce consumption by 5 percent. The military, however, would have to be cut 25 percent to obtain the same gain. The large difference is not all it appears because resources devoted to the three kinds of production are

not of the same caliber. Those engaged in military production are of much higher quality than that of consumer goods. Because of this fact the cost of building up the Soviet military has greater impact on the rate of growth than is apparent by the statistics alone.

The decision to increase the weight of investment involves considerable domestic concerns. Per capita consumption has risen greatly since World War II, but its growth is subsiding. In 1951-60, it grew at 3.8 percent per year. But during the period 1971-75, growth has declined to only 2.9 percent. Any further decrease will diminish the resources available as worker incentives and possibly create serious unrest among workers. Last year alone, food shortages have caused protests in Naberezhniye, Chelny, Chelyabinsk and perhaps other Soviet cities. Discontent might become linked to other sources of unrest, such as minority nationality issues and political dissidence.

The burden of military spending on the Soviet economy has been quite significant. Military expenditures represent about 14 percent of all output, using more than one-sixth of the nation's energy, one-sixth of the chemicals, one-fifth of metallurgy, and one-third of all machinery and metal working.¹³² With the possibility of economic stagnation, with a military where spending continues to grow at a 4-5 percent rate percent per year, the military is an attractive target for cuts. However, the decisions taken at the 25th Party Congress indicate

that reduction will most likely come in the production in consumer goods rather than in the growth of the military. Reduction in the level of military spending would require a basic re-evaluation of the Soviet Union's defense posture. To have an effect of noticeable proportions a much larger share must be cut out of the military when compared with consumption.

A significant reduction in military output, either in absolute terms or in the rate of increase, must be accompanied by the decision to alter its military/political goals. Considering the amount of effort the Soviets have put into military production thus far it is considered unlikely that they will let priorities shift dramatically. Any policy shift is likely to be hotly contested by the interests affected. Joseph S. Berliner states:

"Its (Soviet) economic system is no longer considered a model for the developing nations, as it was a few decades ago. Its technology is nowhere in great demand. In the socialist world it has lost ideological leadership to China, Eurocommunism, and a variety of local communism. Its literature, music and culture, in which the nation was preeminent before the Revolution, have made very little impact. Hence, those political leaders who regard it as important that their nation be respected in the world will be inclined to support the side of the military."¹³²

The Soviet economic system has been able to survive its fundamental deficiencies over the years because of an abundance of labor and easily reached raw materials. Those days are coming to a rapid end. Brezhnev in his report to the 26th Party Congress, made strong pleas for resource conservation. Moreover, Brezhnev included a tantalizing reference to development of liquid synthetic fuels - a radical departure for the

Soviet Party line which has traditionally down graded such projects in favor of increased oil and gas production.¹³³

The Soviet Union has shown a rapid and surprising, in its rapidity, shift from exporter to importer in several raw materials. Most interesting is its purchases of Iranian chrome¹³⁴ and cobalt from Zambia.¹³⁵

The Soviet system is becoming ever more dependent on Western economic technology and support to maintain long term growth. The effects of a cut off would probably be minimal in the short term.¹³⁶ However, in the longer run, most importantly energy production would be affected and the technological gap with the Soviet Union and the West would continue to widen. The Kremlin leadership must be aware of this situation and thus must give it its consideration when planning any action that might jeopardize Western technology.

III. THE POLISH PROBLEM

To fully understand the cost to the Soviet Union of an invasion of Poland, and to comprehend the inherent weaknesses of the "socialistic" economies of Eastern Europe it is necessary to make a detailed examination of the Polish problem. In understanding the Polish economic situation it becomes clear that if the Soviet Union invaded Poland it would place an enormous burden upon itself, solving little and ultimately facing a similar situation in a very few years as the other Eastern European economies falter, and finally chancing the possible short or longer term collapse of its own economic system.

The worth of Poland to the Soviet Union cannot be doubted. In terms of strategic location, military and economic potential and size of population, Poland is the key country in the Soviet bloc. Historically the most often used invasion route to Russia has been across Poland. The broad Polish plains offer an accessible, hard to defend path to the heart of the Soviet Union, while providing the Soviets a similar access to central and western Europe. As a result of its strategic border with the U.S.S.R., Poland can be considered the center of the present day international system in East-Central Europe. Deprived of access through Poland to East Germany and Czechoslovakia, the Soviet position in those countries would become untenable.¹³⁷

Defense and security interests have always been the official reasoning for the Soviet military presence in Eastern Europe.

However in recent years this line of justification has lost much of its validity, as Tessa Rukowska-Harmstone points out:

"By the late seventies the defense justification for the Soviet presence in Eastern Europe was no longer credibly tenable. The West's repeated hands-off attitude has meant the recognition that the region belongs in the Soviet sphere of influence; moreover, the Soviet Union's nuclear parity with the United States has effectively precluded any such interference. At the same time, the new German 'ostpolitik' signaled the acceptance by the Federal Republic of Germany of the post war territorial settlement, the validity of which has been legitimized by all the European states, the United States and Canada at the 1975 Helsinki Conference.¹³⁸

The Western threat to the Soviet Union has greatly diminished and invasion has never been more remote. Nevertheless, the Soviet Union has built up its conventional and theater nuclear power in the region with great intensity. Soviet military hegemony in Eastern Europe, legitimized by the Warsaw Pact and a network of bilateral and mutual defense agreements, evidently regarded in Moscow as essential to the pursuits of Soviet interests in Europe and world wide.

The international character of the Soviet Union as a global power has fallen on an expansionistic and aggressive disposition over the past decade. Presently Soviet and Soviet proxy forces can be found virtually world wide, supporting wars of 'national liberation.' It is clear that with no real threat to the Russian mainland, the Soviet enormous military build up is a method primarily for checking Western response to its aggressive, hegemonic ways in other areas of the world, by dominating the West at all levels of military escalation, while

undermining Western European's will to oppose Soviet actions by a strategy of military blackmail. The center and heart of the Soviet military menace is Poland. The nearness and continuity of the Russian Army to Western Europe has subtle but real influences on their actions. The loss of Poland would completely undermine Kremlin plans and it is undoubtedly considered of supreme importance that it does not occur. It is therefore extremely thought provoking that the Soviet Union has let the Polish problem progress as far as it has. Lack of Soviet actions plainly demonstrate that powerful restraints are affecting their behavior. It is as shown in the last section, the limitations of Soviet action are, to a major extent, economic.

To fully grasp the extent of the political and economic deterioration of Poland it is essential to view it in its historic context. Poland emerged from the Second World War completely devastated. What was not destroyed by the German/Soviet invasion of 1939 and subsequent occupation, was shipped lock, stock and barrel to the U.S.S.R. after the war. Poland still had a better chance at recovery than her eastern European neighbors for she had a significantly larger population, a sea coast, and most importantly a strong resource base, with coal, sulphurs, copper, zinc, silver and lignite, having an energy surplus until 1979.¹³⁹

The performance of the Polish economy since the adoption of the Soviet type system of planning and management and the

introduction of the first five-year plan in 1950 can be largely characterized as brief periods of intense growth followed by long periods of growth decline. According to official statistics the average annual rates of growth of produced national income, that is to say domestic net material product, declined from 9.7 percent during the first industrialization drive effected under the Stalinist system in 1950-55, to 7.7 percent during the first years of Gomulka's leadership in 1956-58 under the influence of large systemic changes; to 5-9 percent in 1959-67; and to 5.7 percent in the last three years of Gomulka's power in 1968-70; this was followed by a burst of growth of 8.1 percent in 1971; 10.6 percent in 1972, 10.8 percent in 1973; 10.4 percent in 1974; and again decline to 9.0 percent in 1975; 6.8 percent in 1976; 5.0 percent in 1977; 3.0 percent in 1978 to a dismal -2.0 percent in 1979.¹⁴⁰ There was a similar trend in the average rates of growth of industrial product, accumulation, fixed capital investment, total consumption and personal consumption. (see table 3-1)

The plan of 1950-55 objective was the transformation and development of the economy of socialist principles, the emphasis was centralism. It called for the greatest possible exploitation of productive capacity and of technological progress. The fullest possible utilization of the productive resources of the economy. This was the so-called strategy of extensive development which in Poland, as in other East European countries, followed closely the Soviet example. The process of growth depended on the increase in the quantity of inputs rather than

Table 3-1¹⁴¹

Rates of Growth: Domestic Net Material Product ("Produced National Income"), National Net Material Product ("Allocated National Income"), Fixed Capital Stock, Consumption, Investment, and Various Relationships (Constant Prices)

	1956-61	1961-65	1966-70	1971-75	1976-78	1971	1972	1973	1974	1975	1976	1977	1978 Plan	1979	1979
DMP	7.3	6.2	6.0	9.8	5.0	8.1	10.6	10.8	10.4	9.0	6.8	5.0	3.0	(2.8)	-2.0
Investment	7.9	6.8	8.2	18.4	2.7	7.5	23.6	25.0	22.5	14.2	2.2	4.3	1.6	(-9.0)	-8.6
Net industrial production	9.0	8.9	7.8	10.8	6.4	8.5	10.4	11.6	12.0	11.4	9.3	7.7	2.5	(5.8) ¹	2.8 ¹
Investment in industry	NA	8.0	7.7	21.9	0	10.4	34.6	26.7	22.2	17.0	3.0	-8	-2.1	NA	NA
Net agricultural production	NA	2.1	-1.6	-6	2.4	8.8	4.7	2.0	-5.2	-11.7	-2	-8	8.3	NA	1.4 ²
Investment in agriculture	NA	12.7	8.0	14.1	5.3	4.4	14.9	17.2	18.0	16.5	2.1	14.2	.2	NA	NA
MMP	7.8	5.9	5.8	12.0	3.5	9.8	12.7	14.3	12.1	10.9	7.0	2.7	.7	(1.0)	NA
Consumption	6.5	5.0	5.6	8.7	5.7	7.7	9.1	8.1	7.4	11.1	8.8	6.8	1.7	NA	NA
Accumulation	10.0	8.5	6.3	19.0	-1.1	15.3	21.5	27.5	20.7	10.6	3.7	-5.3	-1.4	NA	NA
Fixed capital	7.8	4.4	6.1	8.0	9.5	2.9	6.5	7.6	9.3	10.2	9.7	9.8	9.1	NA	NA
Fixed capital per worker	NA	2.8	3.7	5.9	8.9	4.1	4.2	5.3	6.3	8.6	9.7	8.6	8.3	NA	NA
DMP per worker	NA	4.3	3.8	7.6	5.9	6.8	8.1	8.4	7.4	7.5	6.9	8.6	2.3	NA	NA
DMP per unit of fixed capital	NA	1.4	0	1.7	-4.1	1.8	3.8	3.0	1.0	-1.1	-2.5	-4.3	-5.6	NA	-7.3

¹ Sold production.

² Global production.

Sources: G.U.S., "Rocznik statystyczny" 1979 (Statistical Yearbook 1979), Warsaw 1979; "Trybuna ludu," No. 34, 1980, pp. 4,5.

on the increases in their productivity. Emphasis was placed on developing heavy industry in order to provide a firm and stable basis for the development and technical reconstruction of heavy and light industry, agriculture and communications. It was considered self-evident that the development of heavy industries should precede the development of other branches of the economy; most notably consumer goods. In view of these assumptions it is not surprising that approximately 76 percent of planned investment outlays were concentrated on capital goods industries, and due to upwards revisions rose to 89 percent. On many occasions plants were constructed without regard to the supply of raw materials or regard to market potential.¹⁴²

Investment was woefully lacking in the agricultural sector. Plans to increase production were based largely on attempts to increase production per hectare through land improvements. A combination of lack of incentives, and bad weather resulted in stagnation and decline after the first year.¹⁴³

The results of the plan were far from satisfactory. Consumer goods industries output fell from 12 to 8 percent from government neglect. Their products were only remarkable for their low quality, lack of assortment, crude finish, and failure to meet consumer tastes. The capital goods sector became overdeveloped while light industry and agriculture was underdeveloped leading to grave effects on worker's morale.¹⁴⁴

The reactions to the economic failures of the first 5 year plan were strikes and riots by Polish workers. These led to

to the rise of Wladyslaw Gomulka to First Secretary. Gomulka, under heavy pressure from the Soviets, was nevertheless able to make significant changes which to a large extent pacified worker discontent. However, after a pioneering experiment with features of market socialism in 1956-58, there was a return to the traditional Soviet model. The only real modification was the continuation of individual agriculture, though the government retained collectivization as its long-term policy.

Gomulka continued to maintain a system that was extremely centralized, which depended on administrative commands that could enforce a high degree of mobilization of resources and their concentration in a few selected areas, but never able to gain their efficient use. The continued policy of priority development of heavy industry, which produced mostly goods for domestic use for further industrialization, resulted in a limited role for international trade. The "inward looking" policy, by ignoring developments in the outside world, tended to induce over-expansion of the heavy capital intensive branches of metal and heavy engineering industries. Little or no attention was given to benefits from specialization and trade. The newly developed industries were heavily capital-intensive and material-intensive and, in the Polish case, import-intensive. This structure was geared to the continued extensive pattern of development and made the introduction of an intensive pattern difficult.¹⁴⁵ The industrial structure had an adverse affect on the expansion of exports and on profitable foreign

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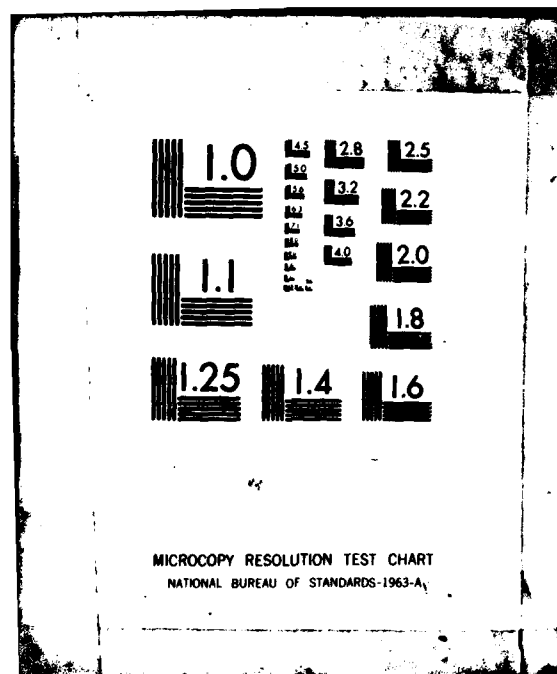
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trade. It lessened the opportunity of supplying the domestic market with consumer goods. Nor was this inward policy conducive to the generation of technological innovation or the utilization of the results of research and development.¹⁴⁶

The system's inability to use innovation for productivity growth is caused primarily by the lack of a spirit of innovation and risk-taking at all levels of economic activity. Whatever the advantages of central planning and direction making for science, policy and control may be its major problem is one of diffusion of technical progress. Experience of industrialized countries has shown that technical progress has not only been propelled by the major inventions, but by the cumulative effect of many minor ones. These minor innovations are those that the centralized system has difficulties generating.¹⁴⁷

The obstacles that the over-directed centralized system produce are primarily derived from the disruptive effect of over-emphasis on current activity. These obstacles include:

- inordinate pressure on plan fulfillment
- the incentive system supporting quantity
- weak rewards from entrepreneurs
- lack of motivation among workers
- priority of quantity over quality.

The constant pressure to fulfill plans that are often unrealistic, force plant and industry managers to use reserves that may be often wise used to implement or generate progress measures.

By the mid-1960's it was well recognized that the source of extensive growth, labor and capital, would soon be drying up and a switch from extensive growth to intensive would be necessary. Furthermore, because of the neglect in comparative advantage considerations and the past reliance on Soviet blueprints and machinery, many newly established industries were not internationally competitive. The inability to expand profitable exports created a balance-of-payment difficulty. A considerable restructuring of the economy was, therefore, needed to reduce capital, promote an intensive pattern of growth, and create a viable export sector.

To shift from extensive to intensive it is required that: (1) reforms are implemented to increase efficiency; (2) restructure and modernize the industrial base; and (3) accelerate technical progress.¹⁴⁸ A reduction in investment is also needed in order to remove the undesirable pressures often associated with extreme levels of investment which included in the Polish case: delayed commissioning of capacities, no increase of consumer capacities, shortages of consumer goods accentuated by growing spending power and shortages of raw materials.¹⁴⁹ In addition it was necessary to prepare reserves to reduce the degree which the market is solely a sellers market, to secure sufficient supplies of consumer goods.

However, at the same time, it was impossible to introduce an intensive growth pattern without enormous restructuring of the industrial structure. Since the early 1950s the Polish

economy was almost completely isolated from the world economy and a policy of horizontal expansion was followed. Polish plants were established exactly to Soviet specification. The technology was largely that which had been in use in the Soviet Union for a long time and the newly constructed plants were obsolete at the time of their commissioning. As the same policy was applied to other East European countries their economies became parallel and extreme problems therefore, developed, in trading among them. This led to unprofitable industries that had to be subsidized at the expense of other sectors, including those like agriculture, which produced some traditional exports.¹⁵⁰ Those enterprises which were making losses persistently and were subsidized at the expense of the rest of the economy had to be replaced or reduced and modern competitive processes needed to be introduced.

A reconstruction program of such magnitude requires a large volume of investment. A new investment drive seemed incompatible with requirements of reducing the pressures within the economy and increasing consumer consumption. Gomulka was thus faced with what Polish analyst Zbigniew M. Fullenbuch calls the socialist "vicious circle of stagnation."¹⁵¹

The Fifth Party Congress held in 1968 attempted to find a way of breaking out of the vicious circle. With Czechoslovakia's experience firmly in mind, structural changes were given priority. The main emphasis was placed on "selective development," which is the development in areas that would result in

Poland being one of the world's major producers of certain items which were to reach high standards of quality and sophistication.

The line of action was doomed to failure. First, an excessively large number of industries were selected for specialization for export. Moreover, the selection was based on central authority that apparently had little contact with the signals of the international market. Finally, the ability to divert funds from consumption to the new investment drive was greatly over estimated. The push required new austerity on top of a low standard of living, two decades of austerity, and economic stagnation.

The results by 1969 of Poland's rapidly rising output was massive stock increases in the nation's warehouses. By 1970 the total value of stock was half that of the GNP.¹⁵² The country faced the specter of mass unemployment, laying off 200,000 workers in 1970. The end for Gomulka was written in the streets by the riots of December 1970.

Perhaps if any one item can be said to be the most significant underlying cause of Gomulka's downfall it is agriculture -- that seemingly perpetual sore point of the Socialist system. Poland's agriculture is unique in that it is the only centrally planned economy that depends largely on private farming. As in other East European countries, in the first half of the 1950s the agricultural policy in Poland was characterized by a forced, though gradual and cautious, collectivization drive.

At the peak of collectivization nearly one-half of the agricultural land was confiscated by the state, which came mostly from former German nationals, Polish citizens of German descent, collaborators and large land-holders.¹⁵³ Of this 60 percent was redistributed to peasants and the balance was used to establish state farms.

The collectivization drive began in the late 1940s, but by its peak effort only 7 percent of agricultural households and about 10 percent of agricultural output originated in the collective sector. But this small quantity greatly understates the impact of collectivization on Polish agriculture.¹⁵⁴

The cost of collectivization was not as high as it was in the Soviet Union in terms of sheer magnitude of misery, but was nonetheless noticeable. State harassment of a nonsubmissive peasantry, which was organized and dominated by the church, caused crop and livestock production to stagnate. The rulers found not only was it difficult to compel the peasants to produce, but work slowed down, farmers reduced the acreage under cultivation, restricted their production of meat and increased self consumption. Wladyslaw Gomulka rose to power in 1956 because the past regime was unable to use the collective farm as an instrument of political power and coercion over the peasantry in which to force increased production.

Gomulka halted forced collectivization and instead instituted a voluntary policy of long term "socialization" which was based on attrition of ranks of private farmers to change

the structure of land ownership. As a farmer was about to retire, the state would "buy" his farm with a pension.

The policies of the 1950s, though falling short of fundamental change, were at least more pragmatic. The need for increased investment of resources to support agricultural activity was recognized. There was some awareness that fear and uncertainty about the future proved to be poor motivators and long term production output suffered. The crux of the government's problem was that the underlying goal was the socialization of agriculture, but also a critical need to increase output. To use bold steps to take over large numbers of private farms discourages productivity, for peasants perceive the threats to their livelihood or property rights. On the other hand, to maintain increases of output requires pragmatic incentives and incomes to farmers which tends to strengthen their hold on their land which frustrated any drive for socialization.

The Gomulka leadership felt it was necessary to socialize for a socialized farm would, according to Gomulka, be more efficient in the long run. Secondly, in an environment of the central plan, privately controlled agriculture was quite responsive to market forces, but not responsive enough to the plan. Gomulka thereby tried to force socialization by investment distribution.

The principle of parity of investment with industry was established in 1965. From that point forward, agriculture

was to receive an equal share of productive investment as its share of the national income. As shown below the outlay of investment went up dramatically during the rule of Gomulka. The production of fertilizers climbed strikingly. By 1968 it had tripled over the figure of 1958. There was also great increases of quality seed and machinery.

TABLE 3-2¹⁵⁵

Investment Outlays on Agriculture 1956-70 in Million of Zloty at 1961 Constant Prices

	<u>1956-60</u>	<u>1961-65</u>	<u>1966-70</u>
Farm buildings	19,881	29,243	59,766
Mechanization	20,153	33,889	50,357
Soil drainage	5,716	12,694	19,457
Total	69,457	102,710	172,797

However, two-thirds of the machinery still went to state and collective farms. In general private agriculture received less than half of the total investment outlay, although it contributed over 80 percent of total production. Such lack of support for the private sector was interpreted as an attempt to show how costly and inferior private farming is when compared with the socialized sector.

The state continued to impose unpopular compulsory delivery quotas on centrally determined terms. The peasant was forced to buy agriculture inputs at a socialized sector, and sell large portions of his output at consistently unprofitable conditions. The planners tried to maintain prices that would

increase the profitability of all farmers. However, the Polish agriculture had an additional problem of economy of size. Unlike the Soviet Union where farm size is uneconomical because it is too large, agriculture in Poland's private sector was uneconomical because it was too small.

The development of medium and large scale private farms seemed to be ruled out for mostly political reasons. The small farms were not conducive to economical mechanization. Many small non-productive farms were taken over by the state. Unfortunately, unless the farms were adjacent to a state or collective farm they were put out of production until socialization reached their area.

The effect of the incremental socialization, the lack of adequate investment in private agriculture, and the poor pricing policies of the Gomulka period was the reduction of the average yearly increase of all agricultural production during the 1966-70 period to 1.8 percent, which was exactly the average annual increase during the disastrous years of the Six Year Plan, and only half the rate of increase of the 1961-65 period.¹⁵⁶ Legislation was passed in 1963 and 1968 to limit the subdivision of farms to facilitate the compulsory acquisition of private farms with some compensation by the state.

The smouldering discontent of the 1960s ended in a political explosion in the middle of December 1970. Two conditions caused widespread food shortages: First, after three good harvests the bad weather conditions in 1969 and 1970 severely

reduced agricultural output, and secondly, Gomulka's capital accumulation drive and his belief that agricultural self-sufficiency resulted in the cessation of imports of grain to feed livestock. The number of cattle and pigs fell drastically and, as in 1959 and 1964, a steep rise in the price of meat became necessary. It was simultaneously decided to raise prices on a wide range of consumer goods as part of a general deregulation of prices. In the form of a Council Ministers' decree, the new higher prices were published on December 13. The results were an average of 8 percent on basic consumer goods and in some cases a much higher percentage.

On December 14 the workers in Gdansk went on strike and staged a political demonstration in the city's center. Gomulka considering the demonstrators counter-revolutionary, refused to have any dialogue with the strikers, and sent the police to break up the strikes. The strikers in Gdansk clashed with the police and became increasingly violent, burning several public buildings including the local headquarters of the party. The following day violence continued spreading to the neighboring city of Gdynia. The police and the army were authorized the use of firearms. The army equipped with tanks, went into action the night of the 15th. On the 16th disturbances spread to Elbug and on the following day violent strikes and clashes broke out in Szczecin on the western Baltic coast. A state of national emergency was called on the 17th, the first time since World War II.

A meeting of the politburo was held on the 18th during which Gomulka was said to have suffered a minor stroke and was taken to the hospital. On 20 December, Gomulka ostensibly resigned his post for reasons of health and Edward Gierek was appointed first secretary.¹⁵⁷

In the final analysis Gomulka failed because of his own inadequacies and those under the system he worked. When Gomulka came to power in October 1956 he embodied the hopes of his countrymen for a better future, offering greater participation in government, a free society and, most of all, economic prosperity. Initially he seemed to meet these hopes, but in the end he bitterly disappointed the Polish people. The climate during the 1960s was largely favorable to reform. However, Gomulka was too cautious, too unimaginative and too much of a traditionalist to see the necessity for radical change. It cannot be said that Gomulka was the sole cause of the economic failure for he worked under many constraints and the constraints of the system were the greatest of all.

Edward Gierek, 57 at the time he acquired leadership, did not hold a broad base of power. He was favored by many of the younger, technical-minded party members, but his principal source of strength was the allegiance of the coal miners from Upper Silesia.¹⁵⁸ Gierek faced the possibility that he would be unable to break out from the vicious circle of extensive development during the period when time was running short. Gierek was confronted by the same intractable problems, a

system that was unresponsive and facing slow degeneration and a labor force that was increasingly more resistive.

Gierek's initial moves were conciliatory. He ended the state of emergency, the increases in the price of food were cancelled and local centers of dissatisfaction were pacified by special dispensation of imported lemons and oranges. Double allotments of bread were made along with other moves that had the effect of increasing worker morale.

The extremely unpopular system of the incentive bonus was withdrawn. The lowest wage brackets, mostly that of pensioners, was raised. The real wage overall was increased by 5.7 percent in 1971 and 6.4 percent in 1972. (see Table 3-3)

For the agricultural sector there was a policy geared to quickly improve food supplies, especially meat. Prices for obligatory deliveries and for contracted food was increased in 1971 and all obligatory deliveries abolished as of January 1st, 1972. Financial contributions by farmers to the National Health Insurance was reduced at the same time, coverage was extended to all of the agricultural population.

As the result of these and other measures net real incomes of the population increased by 9.2 percent in 1971 and 12.3 percent in 1972 and net real income of the agricultural population by 9.3 and 9.9 percent.¹⁵⁹ These improvements to the standard of living and appeals to the population concerning their patriotic duty greatly stabilized the situation.

A "Joint Party-State Commission on the Modernization of the Functioning of the System of the Economy and the States,"

Table 3-3¹⁶⁰

Official Indices of Average Monthly Money and Real Net Wage in the Socialist Sector (without apprentices) and Real Income of Agricultural Population

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Index (annual increases):																			
Money wage-----	11.4	5.4	7.8	3.2	4.4	3.6	4.8	3.1	2.6	4.5	4.0	3.8	3.2	2.9	5.5	6.4	11.5	13.8	11.8
Cost of living-----	5.6	2.0	2.6	4.8	1.7	3.2	2.3	1.0	2.6	1.2	1.5	2.5	1.5	1.2	-2	0	2.6	6.8	3.0
Real wage-----	8.3	3.3	5.1	-1.5	2.6	.4	2.4	2.1	0	3.3	2.5	1.3	1.7	1.7	5.7	6.4	8.7	6.6	8.5
Real income of agricultural population--	5.5	1.9	-2.4	5.4	11.2	-14.8	10.7	2.0	8.6	3.7	-3	8.3	-15.8	2.2	15.4	15.0	4.0	-5.5	-5.1
In zloty:																			
Average monthly wage (without apprentice)--	1,279	1,348	1,453	1,560	1,625	1,680	1,763	1,816	1,867	1,934	2,016	2,016	2,174	2,235	2,358	2,509	2,798	3,185	3,562
Average monthly pension and rest-----	314	443	591	620	647	673	705	739	780	809	847	952	1,056	1,144	1,215	1,260	1,304	1,389	1,545
Average pension and welfare payment as percent of average wage-----	24.6	32.9	40.7	39.7	39.8	40.1	40.0	40.7	41.8	41.8	42.0	45.2	48.6	51.2	51.5	50.2	46.6	43.6	43.3

Source: GUS, Rocznik statystyczny, 1976, pp. xxvi-xxviii, xii-xiii.

was formed to develop a "new development strategy." Out of the commission came a plan whose basic premise was that in order to escape the vicious circle of extensive development, both investment and consumption must grow at the same time. Investments must be large enough to restructure the economy, to modernize its industrial capacity, and to build a viable export sector. This task had been previously frustrated by a lack of material incentives. However, this time increases of consumption were planned in order to stimulate increases in labor productivity and to secure support from the population for the new leadership. The fatal flaw in this plan was that it was only possible if considerable foreign capital could be secured.

The planners expected that with massive help of Western credits and more importantly, imported technology, there would be a rapid expansion in the production of competitive, sophisticated and efficiently produced commodities. These goods were to be produced in new, or extensively modernized plants, utilizing the most modern Western technology, at western standards with some industrial cooperation licensing arrangements with Western firms. It was therefore planned that in a few short years an excess of exports over imports would occur and the debts could then be rapidly repaid. Exports to other CMEA countries, less-developed countries and western nations would increase production and industrial expansion and would insure that an intensive pattern of development would form.

In the final analysis the Gierek leadership did not succeed because its economic plan was widely over-ambitious, gravely flawed, a voluntarist economic policy characterized by incompetent planning and management and most importantly, an unstable labor force, in which nationalism and religious forces were willing to challenge political authority and its economic policies.¹⁶¹

The policy initially yielded positive results. In the years 1971-75, the net industrial product increased at the rate of almost 11 percent per year, which is about 30 percent faster than the preceding decade. Real industrial wages rose 7.2 percent annually, compared with 18 percent in the 1971-75 period.¹⁶²

In the 1971-75 period, the average rate of investment on fixed capital was 18.4 percent and the average rate of growth of industrial investment was 21.9 percent. The annual rates of growth of investment in the economy at constant prices increased from 7.5 percent in 1971 to 23.6 percent in 1972 and 28 percent in 1973. The rate was reduced, but still very high, at 22.5 percent in 1974 and 14.2 percent in 1975. Industrial investment on fixed capital was growing even more rapidly with 10.4 percent growth in 1971, 34.6 percent in 1972, 22.2 percent in 1974 and 17 percent in 1975 at constant prices.¹⁶³

Past experience should have shown planners the problems of excessive investment. Twice before in the 1950s and early

1960s the optimum level of investment was exceeded with negative consequences. The extremely high rates of growth greatly surpassed the capacity of the construction and engineering enterprises. Enormous disproportions and bottlenecks were formed. The unfinished investment projects grew rapidly, resulting in deterioration in workmanship. The final utilization of the foreign technology was highly inefficient and its diffusion slow. As the planners in all the Soviet-like economies are discovering, the import of technology and credits cannot serve as a substitute for structural reforms in the long run.

This rapid influx of investment created a correspondingly rapid climb in personal income. The improvement in the standard of living in 1971-75 exceeded even the plan. The rate of growth of real wages was 7.2 percent in 1971-75, while the planned rate was 3.4 percent. This situation created immense inflationary pressures which resulted in increased imports. The policy was "consumption must become the engine of growth," which forced planners to import consumer goods that could not be supplied rapidly enough domestically.¹⁶⁴

After decades of suppressed personal incomes, improvements were undoubtedly required. Considerable increases in monetary incentives were needed in order to induce greater worker effort. Productivity indeed increased due to greater worker exertion and mechanization. Nevertheless, productivity did not keep up with planner's expectations. The overall low productivity

growth was the result of inefficient use of capital, insufficient time to train workers, and a misunderstanding of the tenacity and magnitude of system constraints.

It was absolutely essential for the success of the new development program that exports rapidly increase to hard currency countries in order to pay off debts.

As shown in table 3-4 problems were encountered with increasing exports. The actual rates of growth, except for the initial period, lagged behind planned rates. The planned rate increase was 12.9 percent in 1973, actual was 11.0 percent. In 1974 the two rates were 18 percent and 12.8 percent, and 22.3 and 8.3 percent in 1975.¹⁶⁵

There were many reasons for the unsatisfactory performance in the export field. Primarily Gierek's planners did not take into account the possibility of an economic recession in the west which would make Poland's products unmarketable and imports expensive. Nor did they apparently do any market research on Poland's comparative advantages. Instead of capitalizing on Poland's supply of cheap labor, Polish investors tried to compete with Western and Japanese products. This Poland has largely been unable to do for the lack of marketing, advertising, servicing and spare parts, among other things, for their export products.

The Poles also had a large domestic market as a result of the excessive expansion of industry. The domestic market represented an easier alternative to exports, which proved

Table 3-4

Planned and Actual Rates of Growth of Import and Export, Balance of Trade with Non-Socialist Countries,
Net Hard Currency Debt¹

	1971	1972	1973	1974	1975	1976	1977	1978	1979
Import:									
Planned rate of growth (constant prices)-----	NA	16.4	20.1	22.0	14.7	17.4	2.7	1.4	5.1
Actual rate of growth (constant prices)-----	13.8	22.1	22.6	14.2	5.0	10.3	.4	1.5	-2.5
Actual rate of growth, non-Socialist countries (constant prices)	20.7	44.8	37.8	19.5	12.1	11.4	-10.6	NA	NA
Actual rate of growth, non-Socialist countries (current prices)	16.1	44.4	65.8	53.4	16.6	8.5	-4.6	0	5.7
Export:									
Planned rate of growth (constant prices)-----	NA	4.9	12.9	18.9	22.3	16.6	13.0	10.0	
Actual rate of growth (constant prices)-----	6.5	15.2	11.0	12.8	8.3	5.4	8.8	5.7	6.7
Actual rate of growth, non-Socialist countries (constant prices)	11.5	14.8	10.9	5.9	5.8	13.1	-.2	NA	NA
Actual rate of growth, non-Socialist countries (current prices)	11.5	15.5	27.0	45.7	11.9	7.7	9.8	7.3	12.9
Balance of trade with non-Socialist countries (billion dollars)-----	.1	-.3	-1.3	-2.1	-2.7	-2.9	-2.2	-1.8	-1.4
Percent of export to non-Socialist countries-----	7.9	-15.2	-50.2	-58.2	-64.8	-65.8	-44.3	-33.9	-23.7
Net hard currency debt to the West (million U.S. dollars)-----	764	1,150	2,213	4,120	7,381	10,680	13,532	16,972	19,590 ¹

¹Provisional.

NA = Not available.

Source: G.U.S., "Rocznik statystyczny 1979" (Statistical Yearbook 1979, p. XLV; "Gospodarka planowa," No. 4, 1972, p. 235; No. 5, 1972, p. 264; No. 4, 1973, p. 240; No. 4, 1972, p. 230; No. 4, 1975, p. 272; "Handel zagraniczny," No. 3, 1977, p. 18; No. 3, 1979, p. 4; "Rynki zagraniczne," No. 14, 1980, p. 3; data on indebtedness provided by Joan Zoeter.

too demanding to the Polish enterprises. Exports require more effort, initiative and flexibility, commodities seldom found in socialistic economies.

The areas of investment, true to Marxism philosophy, were to a very large extent highly material intensive. The main investment projects which were started in 1971-75 in iron and steel, nonferrous metals, chemicals and building materials was material and therefore, import intensive. Furthermore, the industries were energy intensive, at a time of increasing energy costs and rapidly changing markets. These investment projects demanded a 30 percent increase in fuels and energy by 1980, while domestic fuels and energy production, a large export earner, increased only 18 percent. The mix of investment projects thereby created a significant balance of payments pressure. These pressures are now having a serious effect on the Polish economy in that the investment decisions to make production more material and energy intensive forced production to be dependent on the ability to acquire imports. With limited hard currency earnings this can be a spiraling problem in the years to come.

Foreign trade performance was also affected by recession and "stagflation" among the Western economies. The inflation aspect increased prices beyond that planned not only for raw materials, but also for industrial materials required for completion of modernization. At the same time the "stag" or stagnation hampered the expansion of exports to the west, other than coal.

The final restraint on exports concerned the central planning apparatus. In the west, the producer who can guarantee the quality of the product, rapidly change its specifications and characteristics in response to market changes, who can alter the product mix, obtain all necessary materials and parts, will be the firm who obtains the business. The "decree from above" system is slow and incapable of meeting performance demands commonplace in the west. Since few of the products the Polish decided to produce were unique to the world or in great demand, it was necessary for radical system changes to perform adequately to secure a part of the market. The systemic modification failed to materialize and thereby hampered the overall push for export increases.

The adoption of the new development strategy showed remarkable results in the first half of the 1970s. In terms of rates of growth, the Domestic Net Material Product increased 6.0 percent in 1966-70 advancing to a robust 9.8 percent in 1971-75, but declining to 3.2 percent in 1976-79. (Refer to Table 3-4) Difficulties appeared first in 1971-75, and became quite serious by 1977. By 1979 the inability to continue financing growth with foreign capital led to the first absolute reduction in national product since the end of the Second World War.

The very impressive growth experienced in the first half of the 1970s was clearly the result of foreign investment. It represented 9.3 percent in investment in fixed capital

and changes in stocks (Accumulation in Marxist terminology) in 1973, 12.3 percent in 1974, 15.5 percent in 1975 and 16.0 percent in 1976. In 1972-76 there was also a large inflow of western technology, and the increased use of western licenses. In 1971-77 some 300 licenses were purchased as compared with 106 in 1948-65 and 121 in 1966-70. This massive investment strategy resulted in increased growth of fixed capital per employee, which was 5.9 percent in 1971-75, as compared with only 2.8 percent in 1961-65.

The average rate of growth of capital productivity was 1.7 percent in 1971-75, breaking down to a growth of 1.8 percent in 1971, 3.8 percent in 1972 and a continuous decline beginning the following year. Since it is doubtful that the newly created productive capacities were increasingly less efficient the decline must be the result of incomplete capital utilization. This was the result of many things, including: wrong investment decisions resulting in an inability to sell the produced output; delays in completion of investment projects; the lack of supporting infrastructure to place completed industries into operation; and, because of a shortage of energy of materials to operate newly created industry.¹⁶⁹

The deficit in trade with western countries was extremely high in the first half of the 1970s. By 1977 the rising trend was reversed, but not sufficiently to stop net indebtedness from increasing rapidly. It became \$10.6 billion in 1976. \$13.5 billion in 1977, \$16.9 in 1978, \$19.5 billion in 1979,

\$20.6 billion in 1980 and perhaps up to \$27 billion by the end of this year.

It seems that at the end of the first five years the Polish leadership did not yet fully appreciate the magnitude of the problems that began to show themselves in 1974.¹⁷⁰ The directives for the Seventh Party Congress issued at the end of 1975 were full of praise about the unqualified success of the new development strategy. There was no indication that the immense growth was achieved on credit and the indebtedness of the country was growing rapidly.¹⁷¹

In practice the decision to abandon the new development strategy was already forced upon them. To achieve a positive balance in trade with the West by 1978, exports were to grow at an average rate of 14 percent. At the same time foreign investment had to be reduced significantly. Domestic production was to supply 74 percent of total domestic requirements by 1980 compared with 66 percent in 1975. The import of machinery was to be reduced by 40 percent and the import of grain by 50 percent.¹⁷²

The adoption of the plan to decrease the investment coming from foreign sources implied an end to the new development strategy. With the slowdown of foreign capital, the growth also declined. The pattern of development, instead of becoming more intensive, had in effect become far more extensive. This development was directly related to the way the new development strategy was implemented. Planners tried to

restructure the economy in too short a period and without considering the necessary introduction of systemic changes.

The planners aggravated the problem by reducing the deficit in trade with drastic cuts in imports. The cuts had a shock effect which stunted industrial production since industry was unable to purchase materials required for production.

Agriculture received considerable attention in the first half of 1970. The Gierek regime, being ushered to power by food price rates, was quick to improve food supplies, especially meat. The new policy was aimed at the private sector. To increase farmer incentive to rebuild herds, the price of livestock products was increased three times during the first 18 months of Gierek's rule. Additionally, grain prices were increased, land tax rates were reduced, compulsory deliveries were abolished and finally the farmers were given legal title to their land.¹²³

The effect was immediate, with a surge of farm production and sales as shown in table 3-5.

Per capita consumption rose dramatically; per capita consumption of meat rose from 53 kilograms in 1970 to 62 kilograms in 1973.

Gierek, not learning from past efforts, still considered the socialization of agriculture as a priority long-term goal. Through attempted speed up of retirements and by liberalizing terms for eligibility in receiving farm pensions he hoped to induce more peasants to give up their land.

TABLE 3-5¹⁷⁴

Private Farm Gross Output Per Hectare of Land

	<u>1971</u>	<u>1972</u>	<u>1973</u>
Crops:			
Output	101	112	120
Sales*	106	108	119
Livestock:			
Output	106	120	128
Sales*	102	126	136

* Including sales on peasant markets.

Further, despite initial efforts to boost farm income, by late 1974 earnings were again on the decline due to rising farm costs. At the same time poor weather reduced yields of domestically produced foodstuffs. Farmers fearing less deliveries of mixed feed, held back on grain deliveries.

The state was increasingly forced to import grain. The rising prices and the inability to raise food prices led the government to pass the burden on to the farmer. This led to sharp reductions in farmer disposable income by 6.6 percent in 1974 and 6.3 percent in 1975.

With incomes falling the improved pension benefits resulted in a turn over of private land to the state of more than 300 percent increase between 1974 and 1975. Unfortunately the land parcels gained by the state were small and scattered, much of it unsuited for capital-intensive cultivation. During the 1971-75 period, the result was nearly 400,000 hectares put out of production. This could have resulted in a reduction of

about 1 million tons annually of grain, or 38 percent of average net imports during 1971-75.¹⁷⁵

Meat shortages became acute by late 1975. The regime reaction was the threatened seizure of private land that achieved below average yields. Faced with a falling income and renewed government hostility, the private farmer's enthusiasm quickly waned.

The next move by Warsaw was an attempt to control demand and it was about as successful as its efforts in controlling the farmers. In mid-1976 in an attempt at controlling demand, food prices were raised. The magnitude of the prices, averaging 69 percent for meat, 30 percent for poultry, 60 percent for cheese, 100 percent for sugar and 30 percent for selected vegetables, led to the violent riots of that year. Demonstrations and often violent and widespread destruction of property and state owned factories forced the regime to withdraw the price increases the following day.¹⁷⁵

A "new" approach was announced for agriculture. The new policy was essentially the old policy that Gierek had used at the beginning of his rule. Additionally the new farm policy included: (1) expanding production and improving efficiency; (2) enlarging the size of more productive farms at the expense of small farms; (3) boosting the share of private farm output produced on contract with the state.¹⁷⁶

The results of the "new approach" were anything but satisfactory. Output of farm goods failed to rise substantially.

After the heavy criticism of 1975-76 the agricultural workers were poorly motivated and highly skeptical of the regime's long run intentions.

Because of the regime's inability to raise food prices, farm products had to be heavily subsidized. The partial removal of subsidies and the slight rise in food prices on July 1, 1980 led directly to the Polish labor uprising that forced Gierek out of office.

Since the fall of Gierek the government seems unable to face up to its economic problems. It seems that the government's position is that it was not the right time to introduce reforms, because of the existence of serious macroeconomic domestic and external disequilibria.

It is almost uniform opinion of Polish and foreign economists that Poland's present difficulties cannot be eliminated and no recovery is possible without bold systemic changes. Presently no such changes are being implemented, nor as of the time of this writing, are any formulated.

It is a growing feeling among Western bankers that they may well lose their money over Poland. Western loans had to be rescheduled, while payment on loans from the Soviet Union were deferred until 1986. Economic information leaving Poland is commonly described as a highly imaginative mix of "pure propaganda and wild economic projections."¹⁷⁷

The Soviets have contributed financial help to the Polish economy. Besides deferring payment on past loans they have

extended additional credit of at least \$1.5 billion over the past year. Poland's deputy foreign minister, Marion Dobrosielski, reported that Poland had received \$4.5 billion in aid from the U.S.S.R. since the summer of 1980.¹⁷⁸

The deterioration of the Polish economy in the past few years can hardly be understated. Because of strikes and the lack of hard currency to buy raw materials, industrial production has dropped 18 percent in May of 1981 when compared with one year ago. The projected annual decline in national income, Deputy Prime Minister Madej reported to the Polish Parliament in July 1981, is 15 percent. Without new credits, its exports this year will not be enough to pay interest payments on non-rescheduled loans.

The plans for economic stabilization are yet to be firmed up into a usable scheme. For the short term, increased coal production, development of private agriculture, removing of subsidies to raise retail prices, and restore a balance to the domestic market, and diverting energy, raw materials and manpower to industries geared to export, are all often mentioned solutions. What will be eventually possible is difficult to foresee.

A longer term solution needs to be a revision of the entire structure of economic planning. Decentralization of decision making, decreasing the authority of the Central Planning Commission and turning individual enterprises into self regulating units are all necessary elements that have long been recommended by Western analysts.

The problem short term recovery efforts are having is that "Solidarity" has opposed measures of higher prices, longer hours, and worker relocation. It will be necessary, though perhaps not possible, to persuade the Polish worker of the overriding importance of such measures.

In the long term, the increasing dependence the Poles are having on the Soviet Union, by supplemented Soviet oil and loans, place a significant degree of leverage with the Kremlin leaders over Polish economic decisions. Moscow is bound to become resistant to economic changes that are contrary to Marxism-Leninism.

The prospects for the 1980s are desperate in the short and medium run, but the longer run is not totally hopeless. Ideally the Party could leap beyond Gdansk in a brotherly agreement with Solidarity and the workers, blessed by the Church, which induces full cooperation of the Polish people in a plan of austerity, revolutionary economic reforms in industry and agriculture and hard work under competent management. Soviet and Western creditors could be generous and patient, international economic conditions could improve and the weather could be favorable. Such factors could then lead to external and internal equilibrium.¹²⁹

The conditions for ideal economic recovery seem unlikely. The Polish people have lost faith in their system and seem unwilling to make significant and continued sacrifices to pay for the mistakes of the 1970s.

If the Soviets do not intervene, the more realistic prospects are difficult to foresee and are largely dependent on the changes enacted to the centralized economic planning system. Solidarity has shown some restraint at the time of this writing (September 1981), but it is difficult to estimate the amount of control Solidarity can effect on the workers if unpleasant orders are required. The most optimistic economists do not expect any turn around until 1986. Even these assume rationalization of the price structure; reallocation of investment; modernization of the private sector in agriculture; major reforms of the economic system; and, a lengthy period of austerity. This may be a great deal to assume.¹⁸⁰

The Polish leaders must obtain worker cooperation and a positive plan. If they are too tough they could provoke a worker explosion that, no matter the economic consequences, could force a Soviet intervention. If they manage to succeed in muzzling Solidarity they could lose Western cooperation from creditors. Such an act would result in a cut off of imports, and economic chaos. The stakes are high, the solutions few and hard, and the Soviet and Polish leaders should realize this.

IV. CONCLUSIONS

War in the future may become obsolete.
It will be too expensive to wage.

--Dr. Looney--

The economies of the Soviet Union and Eastern Europe range from poor to desperate. In past years cheap and abundant Soviet oil, Western trade and capital fed a program of consumerism and modernization. Increased economic interdependence with the West has become a necessity of economic policy in most of these countries. The means of fulfilling economic goals will be sharply restricted in each of the Warsaw Pact nations for a variety of reasons in the upcoming years. If the Soviet Union invades Poland the spector of economic collapse could be realized resulting in financial chaos, suffering, and political upheavel thereby forcing the Soviet Union into an unacceptable situation requiring action that could create the gravest risks to itself and world security.

In the eyes of many East Europeans the benefits of Western "economic miracles" await East European economies from the effective utilization of imported technology. In order to increase the efficiency of production and raise the quality of products to the level that would be competitive in the world market, increased importation of Western processes and technology is required. The expanding necessity to import oil from OPEC countries to sustain domestic economic growth

demands the generation of "hard goods." Without the ability to pay for imported oil and Eastern European economies can only stagnate or decline.¹⁸¹

The expansion of hard currency trade continues to pose extreme difficulties. Eastern European goods, even those constructed with Western technology, are often not competitive on world markets. This places a dilemma on the governments of Eastern Europe. On one hand the need to keep the Western debt burden to manageable portions, to economize scarce hard currency resources for domestic and Eastern markets and to reduce their like exposure to economic crisis and political upheavals due to Western commercial relations, such intercourse should be held down. But, on the other hand, to satiate the essentials of interdependence, modernization and consumerism a policy requires the opposite.

Oil, natural gas and other raw materials and industrial requirements are expanding, creating often critical import necessities from the U.S.S.R. which are needed in the drive for growth. Soviet price increases and frequent requirements to provide hard currency in payments reflect its own inability to continue as a source of cheap raw materials and its growing need of Western goods.

Such costs have had a negative effect on Eastern economies, generating pressures to reduce the overall trade with the U.S.S.R. and Western Europe. However, Warsaw Pact and Eastern solidarity tend to impose high cost and burdens on domestic

economic planning that are difficult to side step. Furthermore as arduous as economic relations among CMEA and the Soviet Union are, the Soviet supply of energy is still the critical aspect of Eastern European economic growth, and without it the CMEA would not be a viable economic unit.

In order to restructure the Soviet like economies from extensive to intensive, priority must be given to investment, especially for the construction of modern plants and facilities that can generate hard goods. Future growth and economic health depends largely on investment and to efficient use.

Current pressures force giving priority to programs that have adverse effects on domestic investment. These include increasing domestic consumption for incentives; Western repayments of loans; and maintaining agreed on Warsaw Pact defense claims. Defense expenditures preempt scarce, high quality production facilities and skilled manpower. The military effort of the six Eastern European Warsaw Pact countries is quite substantial, amounting to about one-half the force size of the United States with about one fifth the total defense outlays of the United States in 1977.¹⁸² If the Soviets invade Poland a Western response will surely be increased defense outlays that will undoubtedly result in the Soviet Union reciprocating and forcing its allies to do likewise.

In the atmosphere that is increasingly facing Soviet type economies, the inadequacies of their economic management systems is becoming intolerable. All the adverse features of

		Table 4-1 ¹⁸³								Million US \$	
Eastern Europe:		Gross and Net Hard Currency Debt to the West									
		1971	1972	1973	1974	1975	1976	1977	1978	1979	
Total											
Gross		6,072	7,398	9,762	15,352	23,033	29,351	36,695	46,901	54,730	
Net		4,927	5,723	7,950	12,732	18,657	25,297	32,860	42,267	49,260	
Bulgaria											
Gross		743	1,009	1,020	1,703	2,640	3,198	3,707	4,263	4,500	
Net		723	909	997	1,360	2,257	2,756	3,169	3,710	3,730	
Czechoslovakia											
Gross		485	630	757	1,048	1,132	1,862	2,616	3,206	4,020	
Net		160	176	273	640	827	1,434	2,121	2,513	3,070	
East Germany											
Gross		1,408	1,554	2,136	3,136	5,188	5,856	7,145	8,894	10,140	
Net		1,205	1,229	1,876	2,592	3,548	5,047	6,159	7,548	8,440	
Hungary											
Gross		1,071	1,392	1,442	2,129	3,135	4,049	5,655	7,473	8,020	
Net		848	1,055	1,096	1,537	2,195	2,852	4,491	6,532	7,320	
Poland											
Gross		1,138	1,564	2,796	4,643	8,014	11,483	13,967	17,844	21,100	
Net		764	1,150	2,213	4,120	7,381	10,680	13,532	16,972	20,000	
Romania											
Gross		1,227	1,249	1,611	2,693	2,924	2,903	3,605	5,221	6,950	
Net		1,227	1,204	1,495	2,483	2,449	2,528	3,388	4,992	6,700	

the central administrative command system, which have been well known for decades, are now at a critical level. Movement must be made toward market socialism or perhaps a centrally planned system that is effectively modified to increase flexibility of the economy which is necessary to expand exports to the West.

As shown in table 4-1 the Soviet and Eastern European debt has risen dramatically in recent years. By 1979 debt service equaled 18 percent of Soviet earnings, 92 percent for Poland, 54 percent for German Democratic Republic, 37 percent for Hungary, 22 percent for Romania and Czechoslovakia, and 38 percent for Bulgaria.¹⁸⁴

The Soviet Union is in the most favorable position presently among the CMEA countries, and should remain so for the foreseeable future. In 1978 Moscow earned an import/export surplus of \$1.3 billion largely through heavy gold and arms sales. As a result, gross Soviet hard currency debt grew only by \$1.5 billion. Although gold sales were reduced from 400 tons in 1978 to 220 tons in 1979 (see table 4-2), the jump in gold prices allowed the Soviet Union to earn \$2.2 billion in addition to substantial arms sales.¹⁸⁵

Continued high prices for gold and oil, along with greater earnings from arms sales should continue to maintain a manageable export balance. In the longer run, production problems for oil, the mainstay of Soviet hard currency earnings, which fell for the third straight year, will have a significant effect on hard currency earnings.

Table 4-2¹⁸⁶

USSR: Hard Currency Balance of Payments

	Million US \$		
	<u>1977</u>	<u>1978</u>	<u>1979</u>
Current account balance	751	1,266	4,111
Trade balance	-3,300	-3,794	-2,609
Exports, f.o.b.	11,345	13,157	19,524
Imports, f.o.b.	-14,645	16,951	21,593
Gold sales	1,597	2,673	2,200
Invisible and other hard currency trade, net ¹	2,454	2,387	3,980
Capital account balance	1,917	173	-1,127
Foreign borrowing	1,777	1,785	-27
East European loans for Orenburg project	900	286	
Foreign lending	140	-1,612	-1,100
Net change in assets in Western banks	240	-1,512	-1,000
Supplier credits extended	-100	-100	-100
Net errors and omissions	-2,668	-1,439	-2,668

¹Including net earnings from tourism, transportation, investment income, official transfers, military sales, and known hard currency trade under bilateral clearing agreements.

The Eastern European countries, without large gold deposits, oil surpluses or a viable arms export business will be in a much poorer shape in the upcoming years. As Soviet oil production levels off and perhaps decreases, Eastern Europeans will have a critical need for foreign oil. If commercial banks, after experiencing the Polish problem, are still willing to continue lending to Eastern European countries, then the probable trend for indebtedness is a rapid rise.

The Soviet Union is under immense pressure to crush the Polish rebellion. The growth of a powerful independent trade union movement poses a grave threat to the Soviet's hold on Eastern Europe. Furthermore, Soviet efforts at dominating Western Europe would be all but destroyed by a neutral Poland. However, the cost in terms of economics appears to be potentially infinitely greater.

At a minimum the consequences that would result from a Soviet invasion of Poland would be:

- (1) Polish default on loans. Western credit agencies and banks would no longer be willing to roll over or refinance maturing debts.
- (2) Greatly diminished lending to other Eastern European countries.
- (3) A NATO boycott of the Soviet Union in the areas of grain, technology and machinery.
- (4) Greatly increased defense spending, by the NATO countries and perhaps China.

(5) Complete loss of stature among 3rd world countries.

(6) A stronger western stance by OPEC countries.

The long term effects of such actions would be difficult to determine. If the Soviet Union is able to pick up Poland's debt then the legal effects of default would be avoided. However, it is questionable if the Soviets are capable or willing to absorb an additional \$30 billion dollar debt. The Soviet debt would nearly double and it is doubtful that they are willing, or have enough gold or other hard currency earnings to cover the additional indebtedness payments. Furthermore, if the Polish debt could be rescheduled for a longer period of time, the Kremlin planners would still find it difficult to pay due to their upcoming hard currency problems relating to declining oil production exports. If default cannot be avoided, attachments of Polish cargoes, ships and foreign assets would be forthcoming.

The results of a grain and technology embargo would have little short term effect. Other grain producing countries would probably be willing to continue to export to the Soviet Union even under U.S. pressure not to do so. However, it is doubtful the Soviets could continue to buy the necessary amounts of grain to keep from distress slaughtering of livestock. Furthermore, the price of grain would undoubtedly be significantly higher, affecting balance of payment problems.

The great inponderable is, of course, how the Poles would react. The Polish army is 317,000 man strong with a long

anti-Russian tradition. Polish villagers are avid hunters and good marksmen, while the country's miners have plenty of dynamite with which to blow up railroad and supply lines.

If the peasantry burns their crops and the factory workers destroy their factories then the Soviets would be faced with a Polish welfare problem. The Soviet Union does not have the capacity to feed itself, it is extremely doubtful they would be able to buy enough grain to feed both the Soviet citizens and the Poles.

The Soviets would then be faced with a choice of depriving Soviet citizens to feed Poles, or letting the Polish population starve. Neither alternative would be particularly attractive to the Soviet leadership. If the Soviets did the former, the Soviet citizen could revolt. If they decided on the latter, the West would be greatly hardened in their resolve to maintain sanctions against the Soviet Union.

The lack of technology imports to the Soviet Union would have only minimal effects initially. However, in the longer term the effects could be catastrophic. Oil and gas production are largely maintained by Western technological products and pipe. The complete cut off of both would greatly accelerate the oil problems the Soviets are presently facing. A shortfall in oil and gas production would have enormous effect on Eastern Europe and the Soviet Union.

If the technology boycott remains in effect for more than one or two years the overall effect on Soviet industry would

become much greater. Though technological Western products are only of marginal value in short run, they have the affect of keeping the Soviet industry current and providing gains in productivity over longer periods of time.

The Soviet economy is strained to a high degree. It is providing the maximum amount of investment that is sustainable without massive cuts in consumptions. Continued growth in military outlays at a time of economic stagnation appear to be taken from consumption. If the Soviets invade Poland it is doubtful if the Polish reaction will be of the Czechoslovakian type. If the casualties among the Poles are "only" at the 1956 Hungarian level, where tens of thousands were killed, the Western response will certainly include larger defense outlays.

With the Soviet economy stretched already, great increases of defense spending would place a large burden on consumption and/or investment. If the Soviets were forced to feed and reconstruct a shattered Poland the cost could be very difficult to maintain.

To the Soviet leadership the one pertinent question is how much deprivation are the Soviet citizenry willing to endure before they become violent. Western observers have noted for some time a profound crisis of spirit has fallen over the U.S.S.R. The atmosphere of general invitation and virtual disappearance of commitment to Marxism-Leninism have often been reported.

Resentment and loss of faith, that their system is capable of providing even the Russian's low expectations of living standards is prevalent. With earnings only slightly larger than 10 years ago, the worker is faced with prices that have soared -- 50 percent for restaurant meals, carpets, and sheepskin, 100 percent for gasoline, 300 percent rise for coffee in one year.¹⁸⁷ Even the cost of drunkenness has risen 200-300 percent in recent years. The price of the Volga automobile was raised from 9,000 to 15,000 rubles last summer, more than ten years of an average worker's salary.

Basic food supplies are erratic. Travelers report that at Gorsky, for example, there is no butter, meat, fruit and flour, and that Kuibyshev residents must spend an entire day in line when they hear that a shipment of chickens has arrived. At Yaroslavl meat supplies are so lacking that the stores now sell caramels and tea instead.¹⁸⁸

Parts of the Soviet Union are under rationing. Cards issued in Siberia granted two kilograms of meat, if any was available. At Kazan the monthly ration is 400 grams, if it can be obtained. Milk is said to be available only to those with a valid prescription.

The level of turpitude is less than it once was, but the awareness is greater. Furthermore, the increased knowledge of conditions in other countries has helped decrease the willingness to accept continued shortages. Festering feelings of system decadence has resulted in an upsurge of nationalistic passions, which are anti-Russian by their very nature.

Open protesting of subjugation of the Russian Empire is common now among Lithuanians, Ukrainians, Estonians, Georgians, Armenians, Uzbeks and many of the Muslim peoples. One author noted, "With the glue of belief and trust gone, the regime is weak, and holds itself together only by showing force to its own people and to the world."¹⁸⁹

Despite such negative views of the Soviet Union the Russians continue to tolerate what even Eastern Europeans would find intolerable. The Soviet system of control can be considered analogous to a boiler with social pressure as steam. The pressure in the Soviet Society is enough to burst any normal boiler, but the Soviet boiler is very thick and the Russian is a slow boiling water.

Soviet propaganda with skillful selection, misrepresentation and distortion in combination with an incredible police system has kept dissent bottled. How long it is capable of doing so with the larger pressures of a Polish invasion remains to be seen.

What is clear is that the Soviet Union is run by old, naturally cautious men who are inclined not to take chances. Poland is a critical problem with solutions that are not predictable or assured. This is perhaps the single most inhibiting agent to Soviet action.

In conclusion, it is apparent that the Soviets face enormous economic problems in the near future which defy easy solutions. The Polish situation poses a dilemma to the Kremlin

leaders which offers no simple answers. The Poles can only become more independent and resistive as time passes, opening up the possibility of a rapid spread of the "Polish disease" throughout Eastern Europe as their economies falter. Nevertheless, the Russian economy is unhealthy and without reforms faces only more difficulties in the future which greatly restricts the number of options open in solving Polish transgressions. The Soviets are confronted with a demographic constraint, a difficult energy problem, hard currency earning restraints, and a system that lacks the flexibility to solve these critical difficulties.

, The result of a Soviet invasion of Poland would very likely mean economic chaos to the U.S.S.R. The Russian leaders are certainly aware of this and, to a large extent, have refrained from action because of it.

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