NEO-DROVICIC EVOLUTION AND INCENTIVES IN THE SOVIET UNION

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CONTENTS:

Recent Soviet Economic History..........................1
Performance of Soviet Industry.........................5
Case Studies: The Soviet Tractor and Chemical Indus-
tries..........................................................9
Consumption in the U.S.S.R. .............................12
Structure and Incentives of the System..................17
Conclusion.....................................................26
In the short span of sixty years, the Soviet Government has transformed the Russian realm from a rural peasant society into the world's second largest economy. Utilizing techniques perfected under Stalin, the Soviet Union was able to mobilize vast amounts of resources and labor in order to sustain high rates of economic growth. This input intensive strategy, along with centralised planning and control, have distinguished the Soviet economy from the industrialised states of the West. Moreover, this reliance upon increases in the quantity of inputs as opposed to improvements in the quality of those inputs has left the Soviet economy deficient in numerous ways.

The purpose of this paper is to examine the performance of the Soviet economy at the micro level, and to examine the incentive structure which prompts economic behavior in the Soviet Union. In addition, this paper will attempt to argue that the Soviet system of economic management will need to be fundamentally altered if performance is to improve.

RECENT SOVIET ECONOMIC HISTORY:

Since World War II Soviet economic growth has proceeded at a rapid, albeit declining, pace. Between 1951 - 60 the Soviet economy grew at an average annual rate of 5.8 percent, which declined to 5.1 percent between 1961 - 70, and has continued to decline in the seventies with growth averaging 3.7 percent from 1971 to 1978.¹ Currently Soviet economic growth is hovering around 2.5 percent per year.²

The major factor in Soviet growth has been a high rate of investment, which has also been declining. Reflecting this, the rate of growth in fixed investment, which was 11.9 percent between 1951 - 55, has declined to roughly 5.7 percent in the period from 1976 to 1978.³ Similarly, the rate of growth of consumption has declined as well. From 1951 to 1955 consumption grew at an annual rate of 5.4 percent and declined continually (as did investment) up to the period from 1976 to 1978, when consumption grew at an annual rate of 3.3 percent.⁴

As might be expected, high rates of savings and investment
(and hence low rates of consumption) were the main forces behind Soviet economic growth. Indicative of this the rate of growth of investment, for all periods between 1951 through 1973, was significantly higher than the rate of growth in consumption. In general, the rate of growth in consumption was roughly sixty percent of the rate of growth in investment, with the growth in consumption between 1976 and 1978 equal to 56 percent of the growth in investment. 5

These figures illustrate the classical growth strategy adopted under Stalin, but which has remained basically unaltered to the present day. Symptomatic of the classical growth strategy has been the comparatively small share of technological progress as a source of economic growth, relative to other industrialized countries. For example, between 1950 - 62 technological progress was the source of 79 percent of the growth in output in France, 78 percent in Italy and 77 percent in Norway. 6 In every major industrialized country in the West, technological advancement counted for no less than fifty percent of the growth in output. The comparative figure for the Soviet Union was 42 percent. 7

Poor technological performance need not threaten economic growth, provided the availability of inputs is not reduced; however, in the Soviet Union, as it was in the past, this will no longer be the case. First, the availability of inexpensive, easily exploitable reserves of oil, iron ore and coal is declining rapidly. This has forced the Soviets to explore and exploit the resources in the inhospitable and costly regions of Siberia. Even if the Soviet Union is capable of meeting its domestic needs of raw materials, it is almost certain that the costs of these materials will rise. Second, the availability of surplus labor will also undoubtedly decline; thus, also will the ability of the Soviet Union to supply industry with its growing needs. This is so for two reasons, the major one being the lack of surplus agricultural labor and the second being an overall decline in the rate of growth of population. Finally, with the exception of agriculture, the Soviet economy is likely not undercapitalized. If anything, it is just the opposite: the problem is that the age and overall technological level of Soviet capital is not desirable. Thus, future economic growth cannot be expected from
safety increasing the mix capital in each sector, in order the classical growth strategy of increasing gross through increasing inputs of land labor and capital, will undoubtedly experience diminishing returns and increasing costs as the economy attempts to further progress.

These occurrences and their effect on Soviet economic performance have led the Soviet leadership on a search for an alternative strategy of economic growth. This attempt to de-Stalinize the economy was manifested in the Kosygin reforms of 1965. Also, the need to improve the technological level of the Soviet economy was undoubtedly a primary goal behind increased Soviet trade with the West during the 1970s. Yet, as alluded to above, neither of these alterations in Soviet economic policy has succeeded in turning the Soviet economy around. In my view, and as is hopefully shown below, these policies will not succeed until they are able to alter the incentive structure, and hence, the behavior of the micro-economic units of the system (enterprises and consumers).

PERFORMANCE OF SOVIET INDUSTRY:

A crucial element in improving the Soviet economy is the improvement of its industrial sector. Indeed, one of the system's greatest flaws lies in the wasted resources resulting from inefficient processes and organization. Inefficiencies abound in nearly every sector of Soviet industry, but seem to manifest themselves in four major ways: 1) The delivery and production of intermediate goods (i.e. goods used to produce other goods); 2) The overuse of material inputs and the tendency to inflate costs in the production process; 3) The lack of and poor quality of peripheral or supporting industries and infrastructure; 4) Overall inability and/or unwillingness to improve the quality of the production process through technological innovation.

The problem of inadequate supply and late delivery of intermediate goods is one of the most fundamental deficiencies of Soviet industry. It impacts greatly upon the incentives facing Soviet industrial managers, in an adverse manner, and contributes greatly to two of the Soviet Union's worst economic afflictions: storming and hoarding.
The phenomenon of cramming, the rush to fulfill the plan at the end of the period whether it be months, quarters, years, or five-year periods, is according to most observers, a pervasive feature of Soviet industry. In an interview with a Russian engineer Hedrick Smith reveals the extent of the problem. Stated the engineer: "It is a good month if absolutely everything required (for production) is actually in hand by the 20th of the month." According to this engineer his experience is not an isolated occurrence, rather it seems to be the normal state of affairs. These delays obviously have many repercussions on the production process and hence: "Factories must fulfill 80 percent of the plan (quota) in the last 10 - 15 days of the month." Quite likely, under these conditions, little attention is paid to quality; thus we can also see how one problem (supply) interacts with and exacerbates other problems (quality).

Supply difficulties also lead to other aberrations in industrial performance. For example, uncertainties in the supply of intermediate goods (inputs) can cause enterprises to integrate, unnecessarily, 'upstream' (i.e. take over production of its own intermediate goods). Often this leads to inefficiencies in production due to lack of economies of scale, or to colossal sized enterprises with exactly the opposite problem (diseconomies of scale because of managerial problems). A good example of excessive vertical integration would be the Kama River Truck Plant which contains a foundry, a forging plant, a body plant, an engine plant, an instrument and repair plant, and an assembly plant; all of which are capable of producing 150,000 heavy trucks and 250,000 diesel engines per year.

Late delivery and insufficient quantity of intermediate goods are not the only supply problems confronting Soviet managers. It seems that both the content and quality of goods used by enterprises often leave much to be desired. For instance, the general director of the Kiev Footwear Association places the blame of poor quality, drably-styled footwear onto his suppliers. He complains: "And what can you do when, for example, it is advantageous for the textile mills to supply us with huge lots of fabric of the same color". He continues: "I do not think that we in the shoe industry are to blame for all of our
problems. People curse us and file complaints about soles and uppers that let in moisture, cracks in leather, tasteless col-
lores; finish that doesn't hold up and drearily monotonous fab-
rices. But these, after all, are 'sins' of our suppliers. The 
director continues on to name other bottlenecks caused by sup-
ply problems, most notable of these is the inadequate supply 
of spare parts for shoe making machinery as well as the un-
availability of the machinery itself. The quality of packaging 
seems to be another problem facing the director. He states:"We 
are offered the lowest grade boxes. For years we have fought 
to give footwear a durable and elegant form, but with the kind 
of packaging we use now it is not in salable condition by the 
time it reaches the stores."^14

As shown above, the deficiencies of the system in supply-
ing enterprises with the necessary inputs of the production 
process has created numerous irrationalities and inefficiencies 
in the Soviet economy. Supply problems are also a primary cause 
of enterprises hoarding labor and raw materials in an attempt 
to alleviate the consequences of a supply disruption. It is con-
icievable, then, that a vicious circle exists. Supply disruptions 
lead to hoarding which leads to further supply problems.

A second deficient area of Soviet industrial performance 
concerns the tendency of Soviet enterprises to over-use mate-
rial inputs and to inflate costs unnecessarily. As a gross 
illustration of over-use of inputs one could look at steel us-
age in the U.S.S.R. relative to that of the U.S. The Soviet 
Union produces roughly 60 percent of what the U.S. produces 
in terms of GDP; yet the U.S.S.R. out produced the U.S. in 
raw steel production, in 1978 by 27 million metric tons (151 
vs. 124 mmt).^15 As Herbert Block notes: "It would be a mis-
take to conclude that the U.S.S.R. is 22 percent stronger than 
the U.S. (because it produces more steel). It is a weakness 
that requires the Soviet economy-with its modest car and con-
tainer production- to use up to 21 times as much steel per 
unit of GDP as the U.S."^16 Mr. Block goes on to criticize the 
"ton mentality" of Soviet economic institutions, and their 
fixation with producing large quantities without regard to 
quality; a policy which often leads to the manufacture of 
goods heavier than desirable and wasted steel in general.
The tendency of Soviet enterprises to inflate costs unnecessarily is also a major source of inefficiency within the system. For example, the aforementioned shoe association director states: "For a long time trade organizations have asked that we produce, during the spring and summer period, slippers lined with cotton instead of woolen fabric. We cannot satisfy this request, since the shift to an inexpensive material would reduce product cost. Changing the lining would reduce our sales volume by 374,000 rubles at wholesale prices". Undoubtedly, since gross sales is a major indicator of plan fulfillment, this behavior exists elsewhere in the economy.

The inability of the Soviet economy to provide complementary goods and services, and to provide and maintain economic infrastructure (roads, ports etc.) has been one of the system's major obstacles in achieving economic growth and efficiency. The automobile industry may serve as the best example of complementary inadequacies. A major goal of the Soviet leadership in recent years has been to increase the production of and availability of automobiles. Reflecting this, auto production increased from 162,000 in 1965 to an estimated 1,390,000 units by 1980. However, a corresponding increase in the availability of complimentary goods and services did not take place.

A good example of Soviet inability to increase capacity in the complimentary requirements of the auto industry is in the slow growth of maintenance facilities. In 1977 only 56 percent of the car pool was serviced by the state network. Also, in 1970 there was one repair garage for every 300 cars, yet by 1975 this had only increased to 328 cars for each garage. The availability of gasoline is another deficient area plaguing motorists. Not only is gasoline rationed at 20 liters per week, but in 1977 there was only one gas station for every 1250 cars (in the U.S. in 1977 each gas station served roughly 430 cars). Although the number of autos in the Soviet Union is roughly one one-hundredth the number in the U.S., parking is already a problem in the U.S.S.R. and the willingness and ability of the leadership to improve the situation appears to be limited.

In providing improved and increased roadside facilities (i.e. restaurants, motels, rest areas etc.) the system has not ven-
formed very well. As expected, most of these complements are scarce and serve to discourage the lucky car owner from touring the countryside. A major infrastructural problem is the quality and quantity of paved (as well as unpaved) roads. The total length of surfaced roads in the U.S.S.R. was, in 1976, only 17 percent of that of the U.S. In addition, more than half of the roads are made from gravel or other type of granular construction.23

In spite of having fewer cars on the road, the Soviet Union is estimated to experience an accident rate comparable to that of the U.S.24 The causes of this are numerous, but seem to revolve around poor driver education, drunken driving, absence of proper safety equipment in Soviet cars, and poor roads. Here again, as in the case of poor roads, lack of driver education and the absence of safety equipment, all of which could be termed as complements to the automobile, the U.S.S.R. is deficient. Finally, the production of spare parts is grossly inadequate, and waits of up to a year are not uncommon for even the most basic part (i.e., starters, batteries etc.).

In nearly all other industries stories of insufficient quantity and quality of peripheral or complementary goods abound. A common occurrence is that of constructing a factory in some remote area, and then neglecting the construction of adequate housing, shopping, hospitals etc. for workers. One can view many of these areas as complements, or even as non-essentials, as indeed the Soviet leadership must; yet they can also be seen as serving a basic supporting role in the operation of an efficient economy. Moreover, the absence of these areas must necessarily constrain future economic growth and performance.

Perhaps the most serious long-run deficiency in Soviet industry is its lack of ability and willingness to improve the technological level of its products and processes. A rough indication of Soviet performance in technological innovation is the extent to which it relies on quantitative growth in capital stock (as opposed to improvements in the productivity of capital) as a source of economic growth. Specifically, the Soviets rely upon growth in capital stock for 45 percent of their growth in GNP. In comparative terms, the U.S. relies on growth in
capital stock for 25 percent of its growth in GNP; Japan 27 percent; and 18 percent in Western Europe. Hence, the Soviets rely comparatively little (30 percent vs. roughly 60 percent in the West) upon growth in productivity as a source of increasing output. Moreover, this tendency of relying on increases in the quantity of capital is increasing.

Much of the poor performance of the Soviet economy in improving the technological level of the system can be traced to the Soviets' investment policy. More specifically, Soviet investment tends to be construction intensive, that is, the Soviets invest comparatively more resources into building new plants as opposed to spending more on machinery and equipment. For instance, roughly 51 percent of new investment is in the construction of new factories, while only 31.3 percent is used to purchase new machinery. As a comparison, approximately 41 percent of investment in the U.S. is used to purchase new machinery, while only 37.4 percent is invested in construction of new plants.

Another impediment to modernization of the production process is the relatively small amount of investment used to replace outdated and worn out capital equipment. As a result, obsolete equipment is often operated for extended periods of time, and instead new capacity is added to increase output. This strategy requires that a considerable amount of resources be invested in the repair and maintenance of old machinery. In 1970 roughly 21 percent of all Soviet industrial investment went into capital repairs.

The combination of long service life and extended depreciation rates results in very long expected life spans of capital equipment. Ferrous metallurgical assets are expected to last 90 years, electrical power installations 167 years, and computers were expected to last 50 years until 1974 when this was reduced to ten years. Of course, these policies and their results increase (or fail to reduce) costs.

Some more specific examples of Soviet technological backwardness can be found in the Soviet press. For example, the general director of the Kiev Footwear Association writes: "In certain foreign countries one in every four or five pairs of shoes has its sole 'sewn on' by the new method. But in the
Kiev Association and in the country as a whole, only one pair
in ten is put together this way.\textsuperscript{33}

Or as Pravda criticizes the steel industry: "Matters are no better
as regards the introduction of new equipment and advanced pro-
duction processes. Despite the shortage of coking coal in the
country, the branch has still not mastered the highly efficient
production of coke from gas coal and weak caking coal, hot re-
ducing gases are not used in blast furnaces, and anti-corrosion
coatings are not applied to rolled metal.\textsuperscript{34}

Perhaps the most frustrating aspect of Soviet technological
performance is that most of these problems are not beyond the
abilities of the present system. Certainly, in specific areas
(mostly at a theoretical level) with high priority (i.e. mil-
itary) the Soviets are at a level comparable to many countries
of the West. Again, it is in the areas of lower priority and
in the implementation of known, but advanced technology, that
the Soviets are deficient. However, these areas of lower pri-
ority are many, as the centralized system can only concentrate
on a few areas at a time.

\textbf{CASE STUDIES: THE SOVIET TRACTOR AND CHEMICAL INDUSTRIES}

The problems outlined above are well illustrated by ex-
amining the Soviet chemical and tractor industries. First, the
tractor industry. The single most astonishing fact about the
Soviet tractor industry is its immense size. The Soviet Union
produces roughly the same amount of tractors as do the U.S.,
Great Britain and West Germany combined; yet they still cannot
satisfy demand. This is a reasonably good illustration of the
typical Soviet solution to an economic problem (quantity as a
substitute for quality). The organization of production is a-
gain indicative of Soviet tendencies. For instance, roughly 80
percent of Soviet tractor output is produced in only nine
plants.\textsuperscript{35} This could be caused by uncertain supply conditions
inducing excessive vertical integration, or it could simply be
an indicator of the Soviet penchant for bigness.

Following the "classic growth strategy", the Soviet trac-
tor industry has relied upon increases in inputs, through high
rates of investment, as its primary source of growth. Reflect-
ing this, the Soviet attempt to maintain the 8 percent annual growth rate experienced from 1951-65, through improved efficiency (thus allowing reduced rates of investment) failed. As a result, growth fell to 5.3 percent annually from 1966-70.\textsuperscript{36} As the investment rate fell, so did growth.

In introducing new models, a primary goal in the 1971-75 plan, the tractor industry did not perform well. The original plan envisioned new models accounting for one third to one half of tractor output. In actuality, only one sixth of output consisted of new models.\textsuperscript{37} Moreover, some new models are inordinately expensive in relation to their capabilities; hence, the newer models are out of reach of many users. Another obstacle in introducing new models has been delays in the development of new engines, which in one case has caused a ten year delay in introducing a new model.\textsuperscript{38}

A primary deficiency of the Soviet tractor industry has been in the production of spare parts. The shortages are not caused so much by a lack of production of spare parts, but by an excess demand for them. As an illustration, Soviet spare parts production in 1974 equalled 350,000 new tractors, while in the U.S., with a much larger and older tractor park, spare parts production equalled 64,000 new tractors.\textsuperscript{39} This over-use of spare parts dramatizes many deficiencies in the Soviet tractor industry.

The most obvious weakness is technological inferiority of the Soviet tractor industry. This is not to say that Soviet tractors themselves are outdated, only that the production of those tractors is likely performed at a crude level. Other areas of the system contribute to the insatiable appetite it has for parts. Most serious is the tendency of enterprises to over-produce simple, inexpensive parts, while under-producing the costlier, more expensive ones. Poor maintenance in the field and the tendency to over-repair (i.e., replace good parts along with bad) contribute to excessive use of spare parts. Finally, users of tractors tend to overstock parts just to be on the safe side.

Although the technological level of Soviet tractors is improving, the Soviets are responsible for few improvements in
the state of the art and generally copy innovations pioneered in the West. Durability is also a major shortcoming of the Soviet tractor. For instance, the average U.S. tractor needs to be overhauled after roughly 6,000 hours, while the typical Soviet tractor requires a rebuild after 4,500 hours. This is due partly to the poor quality of metal alloys used in the engine, partly to poor craftsmanship during assembly and partly to inferior maintenance and the use of poorer quality lubricants.

These factors have contributed to a very high, very early tractor retirement rate. In recent years, 78 percent of the number of new tractors being delivered to the agricultural sector were retired. Hence, in real terms, the massive volume of resources the Soviets are putting into tractor production is resulting in comparatively small growth in the tractor park. Moreover, the new tractors are not utilized fully because of the shortage of complimentary attachments.

Although some of the problems outlined above are unique to the tractor industry, most plague Soviet industry as a whole. To these problems, the Soviet chemical industry is not exempt. The chemical industry's most serious problems appear to be underutilized capacity and significant input supply problems.

Because the chemical industry has received high priority since the late 1950s it has grown much faster than Soviet industry as a whole. The high growth has thus placed excessive strain on the supporting elements of the industry. Often the construction of chemical machine building plants lags behind the construction of new chemical plants; thus leading to such anomalies as assigning a chemical machine building plant, not yet built, as a supplier to a completed chemical enterprise.

Like many Soviet enterprises, chemical enterprises seek to minimize their planned output targets while maximizing their ability to meet their targets. Undoubtedly, this set of relations contribute to the high level of unutilized capacity. Although the figure is dated, the fact that in 1964 it was estimated that there was 1,874,000 rubels worth of unutilized capacity in the chemical and pharmaceutical industry is no doubt still significant (especially if one accepts the contention that, in general, plans were tougher during the 50s and early 60s
than they are today).\textsuperscript{43} Shortages of raw materials and other intermediate goods also contribute to the high level of unutilized capacity in the chemical industry.

As have most Soviet industries, the chemical industry has comparatively less on improvements in technology as a source of growth and relatively more on increases in factor inputs to increase output. Between 1955 and 1970 it is estimated that increases in factor inputs accounted for 90 percent of the growth in output in the chemical industry.\textsuperscript{44} Thus, roughly 6 to 10 percent of the increases in output were the result of technological improvements. A comparative figure for the U.S. chemical industry indicates that approximately 20 percent of the growth in output was through improvements in technology.\textsuperscript{45}

Although both the tractor and chemical industries have grown remarkably in the past 25 years, they still have significant problems. The problems of supply of inputs, over-use of inputs and inflated costs, the absence or insufficient capabilities of complementary industries and sectors and, finally, the inability to increase output through improvements in technology still persist in these two industries, and in Soviet industry entire. Moreover, these problems do not appear to be on the wane.

CONSOLIDATION IN THE U.S.S.R.:\textsuperscript{46}

In spite of significant progress in the last 30 years, Soviet consumer welfare remains the most visibly deficient area of the Soviet economic system. Indeed, the progress has been great. Between 1950 and 1975 per capita consumption increased 2.6 times.\textsuperscript{46} However, in 1975 the average Soviet citizen consumed at a level roughly one-third that of an average American.

The most rapidly growing of the consumer goods industries has been the consumer durables industry. Of consumer durables, the most rapid increase was in the per capita ownership of refrigerators, which increased from 2.9 per hundred persons in 1965 to 22.9 per hundred in 1978.\textsuperscript{48} In some areas markets for basic durables appear to be approaching saturation. Most of these goods are of fairly standard design such as black and white TVs, and radios. This could be the result of increasing consumer sophistication, and an increased desire for more modern goods, or it be an indicator of the system's ability to satisfy some consumer
demands.

Certainly, one area of consumer durables, namely automobiles, has not been saturated. Demand for autos remains high and the quantities available, although increasing, remain comparatively low. In 1977, for example, there were roughly 5 million autos in the U.S.S.R. This is equal to about one car for every 52 people; a comparative figure for the U.S. is about one car for every two people. Other problems in the consumer durables industry include unresponsiveness of enterprises and ministries to changing consumer tastes, and generally poor quality of products. As an example, a check of a freight load of refrigerators by the Gorky City Organization for Trade in Furniture and Household Appliances found only thirty of eighty in working order. Problems exist (as in industry) as well, in the availability of complimentary goods. Some examples are: tape recorders are generally available, but the chances of finding tape for them are slim; the chances of finding cameras are reasonable, but of finding film (not to mention color which accounts for only 10 percent of all film sold in the Russian Republic) slim.

Perhaps the poorest performance in improving the standard of living of the Soviet consumer has come from agriculture. This is not to deny that there has been significant progress, but simply that agricultural performance has not fulfilled the leadership's goals nor has it met consumer demands for higher quality foods. A good indicator of this has been the slow growth in the improvement of the average Soviet's diet. In 1965, 54 percent of the Soviet diet was made up of starch (grain products and potatoes), while in 1977, 46 percent of the caloric intake of the average Soviet consisted of grain products and potatoes. Comparable U.S. figures for 1977 indicate grain products and potatoes made up only 22 percent of the average American's diet. In addition, meat and fish consumption in the U.S.S.R. increased from 6 percent of caloric intake to, a still modest, 8 percent of food intake in 1977. In the U.S., in 1977, meat and fish accounted for roughly 20 percent of the average American's diet. Finally, the prospects for improving agricultural performance do not look significantly better, as the 1980 harvest fell considerably short of the plan.
Of all the Soviet consumer's problems, the lack of and quality of housing is very likely the most frustrating. Although the quantity of housing has increased markedly, shortages still exist. Bearing this out, the waiting period for a new apartment is often as long as a decade. \(^4\) One source estimates a housing deficit of 9.6 million units existed in 1970. \(^5\) Moreover, newer units, although larger than their predecessors, are still small by western standards, and the construction of such units is generally poor.

More specifically, Soviet housing, by 1977, still had not attained the minimum 9 square meters per capita of living space adopted as the goal in the 1920s, when per capita living space was 8.6 meters. \(^6\) Poor quality, while attributable to many factors, is often the result of construction proceeding too rapidly or left unfinished. One check in Minsk in early 1980 discovered that construction was still going on in 12 of the 14 apartment buildings inspected, one month after state commissions had signed the deeds of acceptance certifying completion. \(^7\) Examples of defective construction abound. In one case two apartment buildings which received a "good" (vs. satisfactory) rating were found to have 1,178 defects only three months after they were accepted. \(^8\)

The major cause of the Soviet housing problem is a historical (and current) lack of investment resources allocated for housing. Another contributing factor would be the source of finance of housing construction. Most finance is controlled by the production ministries and not local governments. Production ministries and their constituent enterprises are often less concerned with the construction of houses than with fulfilling their industrial plan targets. Undoubtedly, if local governments had more control over such non-production areas as housing, the situation would improve. The exceptions to this situation include the large cities of Moscow, Leningrad and Kiev, which could not be dominated by a single large enterprise or association as smaller cities and towns often are.

The poor housing situation has had numerous repercussions on Soviet society. The decline in birthrates in urban areas can
be attributed in part, to a lack of housing space for additional children. Also, an increase in divorce rates may be in part caused by overcrowded living conditions and a lack of privacy (most newlyweds live in an extended family situation).

Of all the Soviet consumers' troubles in obtaining a car, apartment etc., their problems in obtaining service and maintenance for these items is perhaps greater. The causes for poor performance are probably twofold. First, the service sector tends to be regarded by planners as non-essential; hence, services receive lower priority than other sectors. Second, service personnel are often regarded as holding second class occupations. Thus, quality personnel tend toward other occupations.

A good illustration of the lack of resources in the service sector is the lack of equipment available to maintain and repair consumer durables. For instance, in the Russian Federation there exist few resources for rebuilding burnt out electric motors. As a result, only 200,000 of the required 6 million replacement motors are rebuilt. The rest are scrapped, resulting in significant waste. Not only are motors wasted, but by using new motors to replace burnt out ones production of additional appliances is foregone, exacerbating consumer shortages.

In an attempt to alleviate the many problems facing consumers an extensive array of legal, semi-legal and illegal free markets, collectively termed the second economy, have evolved. The types of markets range from officially sanctioned "flea markets", where buyers and sellers gather to trade used articles (often stolen, and other goods obtained illegally i.e. manufactured underground, are traded here as well), to black markets where almost anything is available.

The existence of black markets is nearly universal in all economies of the world, but what distinguishes the illegal economy of the Soviet Union is the extent (in terms of both quantity and the variety of goods and services traded) to which these markets exist. For example, in 1972 the Soviet press estimated that 500 million liters of gasoline were stolen from the state and resold below state prices. The gas station managers and attendants who perform such transactions often pay significant sums of money to obtain what would generally be regarded
The purchase of an automobile can also involve one deeply in the black market. One source estimates that an additional 2,000 rubles of extra payoffs are required to pay for the purchase, registration, inspection, possible garage building and or obtaining a driver's license, when one purchases an automobile.

Apparently, a substantial amount of underground production of scarce consumer goods also occurs. One man in a suburb of Moscow was discovered to have set up a lipstick factory in his basement. Other cases of the illicit manufacture of blue jeans have also been discovered. Often these "businesses" take the form of the cottage industries of early capitalism, with employees being paid piece rates.

In other instances enterprises have been known to overproduce (i.e. in excess of plan) and sell the surplus output along with official output; with the profits distributed along the chain of sale. Additional types of black market activity include private construction teams which build roads, buildings, plants, etc. — usually with materials obtained illegally. Still other entrepreneurs operate false front factories behind enterprises or collective farms.

As could be expected, the vast amount of this illegal activity could not exist without a complete network of corruption and bribery. Quite likely, bribery and other uses of connections is a common solution to an administrative problem. A survey of 132 Soviet immigrants to the U.S. were asked: "If you had a problem in the U.S.S.R. that demanded an administrative solution, what would be the most effective way of dealing with it?" Of the responses: 8.3 percent said they would write a letter to a newspaper, 11.4 percent would speak to a deputy of their local soviet, 6.8 percent would approach the party committee, 15.9 percent would approach the local government, 43.9 percent would do something else, which usually meant bribe, use connections, etc., and 13.6 percent had no answer.

One official, the mayor of Sochi, a port on the Black Sea, was sentenced to 13 years deprivation of freedom and had all of his property confiscated for allegedly taking bribes for most of his nine years as mayor. Apparently, the mayor used his
control over apartments, jobs, cars, vacation trips, etc., to extract bribes from those interested (and willing to bribe a mayor) in such things. The average bribe was in the 1,000 to 2,000 ruble range, but the mayor was not averse to taking 50 to 100 ruble bribes.66

To conclude this section, one can only speculate on the adverse long-run consequences of a system in which a significant number of people are involved in illegal, albeit economically rational, activity. Undoubtedly, the population must become, at least to some degree, more cynical (as people have in the West) and less trustful of those in power. This is not to suggest that they pose a threat to the regime, at least not now, only that they quite likely contribute to the difficulties in running the system.

STRUCTURE AND INCENTIVES OF THE SYSTEM:

From an examination of the above details, one is likely motivated to ask the logical question: what is it within the Soviet economic system which causes or promotes such economic activity? The purpose of this section is to examine the general structure of the Soviet economic system, and also to survey the basic incentives of the system and hopefully to bring forth some explanations of this seemingly irrational economic behavior.

An examination of the structure of the Soviet economy must, almost out of necessity, lead one on a search for a model. Of the several models often used to describe the Soviet system (totalitarian, pluralist, etc.), the corporatist model seems to describe the essential workings of the system the best. A formal definition of corporatism is: "Corporatism can be defined as a system of interest representation in which the constituent units are organized into a limited number of singular, compulsory, non-competitive, hierarchically ordered and functionally differentiated categories recognized and licensed by the state and granted a deliberate representational monopoly within their respective categories in exchange for observing certain controls on their selection of leaders and articulation of demands and supports".67

Some of the more salient characteristics of corporatism
are: 1. an active role of the state in the decision making process, 2. the necessity of planning and 3. the minimization or absence of conflict among interest groups. Ideally, corporatism is bureaucratic politics at its finest. No one group makes excessive or radical demands, but the system requires that each group receive marginal improvements from year to year in their situation. Thus, stability and long-term incremental growth are insured. From this we see that the corporatist system is essentially a status quo system, where each group is placated by the guarantees of the welfare state.

With this background in mind, an examination of the structure and workings of the Soviet economy should prove much more fruitful. Basically, Soviet industrial production is set up on four tiers. At the lowest level are some 50,000 enterprises and another 200,000 subsidiary enterprises in agriculture and construction which produce roughly 20 million products. Enterprises would be the equivalent of a single plant in the U.S. Since 1973, groups of enterprises were merged both horizontally and vertically to form industrial and science-production associations. The rationale behind the move towards associations was to achieve economies of scale and increased specialization in the production process. Associations, therefore, are responsible for coordinating and overseeing the work of their constituent enterprises. The move towards associations, which was supposed to be completed by 1980, had, as of 1977, accounted for only 44.3 percent of production in Soviet industry. The associations are further divided into two types: industrial, of which there are 500 (and are apparently superior to production associations); and production, of which there are roughly 3,600.

At the top of the economic hierarchy are the Ministries and State Committees. As of 1979, there were roughly 51 Ministries and seven State Committees concerned primarily with economic affairs. Ministries are generally assigned a specific industry or group of industries over which they exercise control. State Committees, on the other hand, are generally responsible for areas concerning the operation of the economy as a whole (i.e. Gosplan, the State Planning Committee, which is responsible for planning all industries vs. The Ministry for Machine Building.
The major determinant affecting the behavior of the basic economic components described above is the system of centralized planning. Through central planning, the Soviet Union determines the allocation of resources in the economy, and more specifically the production, output and prices of all goods and services in the economy. Unlike a market economy where prices serve as the basic indicator, or transformer, of economic conditions to firms and consumers, a planned economy indicates or informs its constituent economic units (consumers and enterprises) through a centrally determined plan. Simply, the planning process necessarily consists of three steps. 1. Messages from the center (ministries and State Committees) to the periphery (enterprises and associations). 2. Feedback from associations and enterprises to the center (often to request that original targets set by the center be revised downward). 3. Execution of the plan. Planners often use the previous period’s (years for instance) figures of enterprise performance in determining the forthcoming targets for the next period. This process is known as planning from the achieved level, and is responsible for much of enterprise and ministry behavior.

From this brief examination of the planning process, we can see the crucial role that reliable, accurate information (from center to periphery and vice versa) plays in properly executing the plan. This, indeed, is often one of the greatest shortcomings of the system of centralized planning, and is the source of many of the problems outlined above. In fact, the system is such that, provided planners use targets which are primarily output derived (i.e. gross output, net output, or net sales), it promotes an unreliable and inaccurate exchange of information between the center and periphery. This is so because, under the circumstances described above, enterprises have the incentive to conceal as many of their productive resources as possible, thus obtaining a plan assignment which is easier to fulfill. Similarly, the ministries also have the incentive to set targets above what the enterprise says it can produce, simply on the assumption that enterprises are hiding resources. Quite likely, this set of relations is not unusual, to result in
an optimal plan (i.e., either one which is impossible to fulfill, or a plan which is too easily fulfilled).

These communication problems undoubtedly contribute to many of the afflictions plaguing Soviet industry. The most significant of these would be the existence of excess capacity, if plans are too easy, or the tendency of enterprises to overuse material inputs of capital, natural resources and labor, if plans are too tough. Also, taught plans (which are likely the result of a lack of information during planning) contribute to enterprises' unwillingness to innovate. This so because the process of innovation generally leads to short-run disruptions in the production process. These disruptions in production necessarily lead to increased difficulties in fulfilling the plan. Hence, we can see that enterprise directors, under conditions of tight planning, brought about by informational difficulties between the center and periphery, would be likely to overuse material inputs and be unlikely to bear the necessary risks, and short-run costs, required of innovating the production process.

An essential element in efficiently operating any manufacturing entity is an accurate knowledge of costs. Here again, the system of centralized planning in the Soviet Union encounters difficulties. This is so for several reasons. First, is the fact that information, as shown above, is not always reliable; hence, an accurate knowledge of conditions (i.e., costs) is less likely. The second cause is related to the distortions in the system caused by an imperfect system of wholesale pricing. Imperfections in the system of wholesale pricing are the result of an extensive use of centralized prices which distort the use of many goods. The widespread use of subsidies breaks the relationship, which exists in a market economy, between prices and opportunity cost. The knowledge of opportunity cost, or the value of the resource in its next best alternative use, is essential to understanding "true" costs, and hence, to efficient operation of an economy. Finally, many distortions result from the provision of many capital investments free of charge, therefore, biasing enterprise behavior in perhaps non-efficient ways. Thus, under conditions of imperfect knowledge of costs (the guiding light of manufactur-
ing firms in the West) one would expect imperfect efficiency to result.

As an additional note on planning problems, a consideration of the overall magnitude of the task will prove illuminating. As might be expected in the world's second largest economy, the volume of goods which must have their prices and quantities planned is enormous, numbering roughly 20 million. With this volume of goods to be centrally planned, one would expect the planning process to be a difficult and tedious task prone to significant error.

In an attempt to alleviate many of the planning problems, and their consequences for industrial performance, the leadership has turned increasingly toward the use of material incentives as a means of gaining leverage over workers and managers. The major concrete incentives take the form of bonuses which are awarded on the basis of plan fulfillment. The definition of plan fulfillment (targets) has been altered frequently as the leadership has attempted to correct for this or that problem. Currently, bonuses are limited to 50 percent of total salary, with allowances for bonuses up to 60 percent of salary for high priority projects or industries.

The power to determine and define bonus criteria resides almost solely in the ministries. The ministries can determine bonuses from any of six criteria: 1) labor productivity (defined by the ministry), 2) proportion of products of highest quality in output, 3) profitability on the capital to output ratio, 4) growth of output, 5) reduction of average cost (cost per unit), 6) timely mastery of new capacity. Two of the six, labor productivity and product quality, are mandatory targets. In general, ministries are supposed to use only three or four indicators in defining plan fulfillment.

From the Soviet press, however, one does not receive the impression that labor productivity and product quality, if they are required indicators, are not given much emphasis. A good example is the passage cited earlier from the general director of the Kiev Footwear Association, in which he complains that in switching shoe linings from wool to less expensive cotton, his plan indices would change and his enterprises thus could not
fulfill their plans. From this, it would seem that the director's primary plan indicator was growth in sales, and not labor productivity or product quality. The director goes on to criticize the system of planning from the achieved level as "vexing". He states: "For example, if fulfillment figures turn out slightly lower than the level previously achieved, an enterprise immediately finds itself in an extremely grave financial situation; it fails to fulfill its plan, and its employees lose their progressive piece-rate pay, bonuses etc." 4

From the above, we can see that managers would be loath to undertake any action which might jeopardize their ability to fulfill the plan. It is also quite likely that managers would place less priority on one or more plan targets in order to fulfill those targets which affected their bonuses most. For example, a manager may hire labor (beyond the optimum) in an attempt to achieve his sales growth target, but hiring more labor may cause a decline in labor productivity. Thus, the manager fulfills one target but not the other (i.e. that which affects his bonuses most). Hence, the omnipotent role that the ministry plays, through determining plan criteria, in influencing enterprise behavior, comes forth.

This concentration of power is frequently not conducive to economic efficiency. Quite often ministries have been known to change plan targets in the middle of the planning period. Ministries may also redefine targets in mid-plan; thus, disrupting the "plans" of enterprise managers. Undoubtedly, the ability of the ministry to alter the economic environment of enterprises at will, contributes positively to the level of uncertainty facing the enterprise or association manager. Those conditions could, in part, explain the bureaucratic behavior (don't rock the boat mentality) of managers described in the corporatist model.

The level of uncertainty facing managers has other sources as well. It only does ministerial behavior contribute to managerial uncertainty, but party and government decrees do also. Although well intentioned, the increasing frequency of these decrees, and their equal ability to redefine the environment, have likely increased the already high level of uncertainty fac-
ing managers. For example, rules governing the incentive structure have changed roughly five times since the original reforms of 1965, and have changed three times since 1976. This frequent revision of the rules of the game undoubtedly make long-run planning on the part of associations and enterprises, all but impossible. Additional uncertainty is added to the managers life through the continuous supply problems of intermediate goods. From the above, the generally conservative, risk averse, behavior of managers should be of little surprise.

In general, one must conclude that the basic incentive structure, and the system of power surrounding it, are the basic cause of managers' unwillingness to bear risk in the form of technological innovation. The introduction of a new production process will likely decrease output for some time, hence, also bonuses, until the new technology can be absorbed. If on the other hand, the manager decides not to innovate, plan targets are likely to be met, thus, bonuses are insured. Granted, there are bonuses for innovation which may offset, to some extent, losses in bonuses linked to output, but there are also other "costs" to the manager if he decides to innovate. The introduction of a new product would likely require that new sources of supplies be found, or if production is shut down for some time, while the changeover to the new technology is made, present suppliers may stop shipping supplies and find other buyers. Thus, the manager may find it difficult to regain his original position, let alone improve it, through innovating or introducing a new product. An additional deterrent to introducing a new product is the system of setting prices (thus determining profits) of new vs. old products. The new product will generally have a higher price than the older model, but the newer model's improved quality and performance may make the new product, in real terms, cheaper.

Thus, the rewards for innovation are few and the risks great. The manager who decides to innovate is unlikely, after undertaking the risks, costs and worries of innovation, to achieve a higher level of income than he is by continuing along the non-innovating, but certain, path. Much of the blame
for delays in introducing new products and processes is often placed upon enterprises and associations. In my view, and hopefully as shown above, managers, as they do in most all economies of the world, react to the system of incentives surrounding them. Managers are, in a sense, passive responding to their external environment in a surprisingly rational manner. It is the economic environment, created by the system of incentives, which is to blame, in large part, for the many irrationalities and inefficiencies of the Soviet economy.

Approaching the phenomenon of economic behavior in Soviet-type economies, Janos Kornai has examined the effects of what he terms pressure and suction on economic systems. Pressure is defined as a continuous state of long-run disequilibrium in which producers produce somewhat more than consumers are willing to purchase. Suction is defined as just the opposite, a long-run state of disequilibrium in which consumers' wants are somewhat greater than the available amount of goods and services produced. Thus argues Kornai, the presence of long-run disequilibrium, in either a pressure or suction situation, will have profound implications concerning the behavior of producers and consumers in an economic system.

Under conditions of pressure there is likely to be unused capacity, producers tend to believe they will sell more than they actually do, and inventories tend to be higher. The situation is reversed under conditions of suction. A suction economy operates at full employment and thus makes fuller use of its current stock of resources. From these two differing states of disequilibrium result two differing relationships of economic power.

In a pressure economy buyers have somewhat more power than sellers. Thus sellers compete for buyers. This competition can take several forms. One is price, but price competition in most oligopolistically structured industries is easily countered, thus profits are not generally increased through such a strategy. Hence, managers would be unlikely to adopt this form of competition for any length of time. Another form competition may take is advertising, but, as are price reductions, advertising is relatively easily counteracted by rivals, and it quickly be-
comes a defensive, rather than an offensive, tactic. A final tactic that producers in a pressure economy can adopt to expand sales and increase profits is to innovate the production process and introduce new products. This is a viable strategy because rivals cannot quickly counter major product innovations, let alone the introduction of a completely new product. Thus, producers can expect to receive considerable profits over an extended period of time (especially when one considers the patent system which is present in most pressure type economies). Obviously, the incentives for innovating are great, while the penalties for not innovating are severe (i.e., loss of market share and erosion of profits), under conditions of pressure.

Under conditions of suction an opposite situation exists. Producers sell all they can produce, thus, buyers compete for sellers, and as long as prices remain controlled (as they generally are in suction type economies), the shortages of goods and services (suction) persists. Hence evolves an unequal relationship between producers and consumers, with the balance of power in favor of producers. Necessarily, this affects producer behavior in a negative way. Under these conditions producers need not concern themselves with the quality of production, as sales are unlikely to be affected by inferior quality or poor style. By the same token, the incentive to innovate the production process and introduce new products is also absent under conditions of suction. Producers enjoy monopoly-like power and have near perfect security. Thus, they become complacent and concern themselves little with the needs of consumers.

Kornai's pressure-suction model, as shown above, is quite useful in explaining much of Soviet economic behavior. Many of consumers' problems, as well as most of the disincentives for not innovating can, on a general level at least, be explained by this model. Indeed, the two models used in this analysis (communist and pressure-suction) give a fairly comprehensive picture of the Soviet-type system. One describes the political relations within the system, the other the economic.
CONCLUSION:

As can be gleaned from the above, there are many problems within the Soviet economy, most of which are of a systemic nature. The underlying cause of much of Soviet economic behavior is the distribution of power within the economic system. The ministries on top have too much power, necessarily, they abuse it. The associations and enterprises are the initial recipients of ministerial abuse; however, they also hold considerable power over consumers. Thus, they also exploit their situation at the expense of consumers. Consumers generally do not have anyone to exploit. From this set of relations it is easily understood why the consumer related industries are the most neglected industries in the economy.

On a more specific level, other economic problems can be explained by the monopolistic structure of the industrial system, as described in the corporatist model. The corporatist system guarantees the status quo, therefore, economic behavior by associations and enterprises is severely constrained. They cannot enter new markets nor really threaten (economically) the position of other enterprises or associations. Quite likely, the absence of rivals is a very important factor determining enterprise and association behavior. Thus, in my view, the many attempts to improve the planning process and incentive structure since the Kosygin reforms of 1965 have failed, in large part, because they have not created the insecurity which motivates managers so well. Instead, the many revisions of the incentive structure have created uncertainty from above, which now faces managers. This uncertainty from above is apt to make managers less aggressive, not more, unlike insecurity of one's survival which is likely to promote more adventurous behavior.

Thus, the many revisions in the planning process, the changes in the plan indicators and even the creation of the associations will have only marginal effects on the Soviet economy. This is so because the basic power structure and hence, incentive structure of the system remain unaltered by the various forms of "tinkering" which has occurred in the
past. As long as the survival of enterprises and associations is not threatened by a potential or actual rival their behavior will remain complacent and their performance will not exceed the minimum required by their ministry. Until the two elements of the power structure of the economy and the survivability of enterprises and associations is altered in a meaningful way, the outlook for improved economic performance in the Soviet Union must remain grim.
NOTES:


4. Ibid.

5. Ibid.


7. Ibid.


9. Ibid.


13. Ibid.

14. Ibid.


16. Ibid.


20. Ibid.


23. Ibid.


27. Ibid.

28. Ibid.


30. Ibid, data is taken for period 1966-73.


32. Ibid.


36. Ibid.

37. Ibid.

38. Ibid, p. 605.


40. Ibid, p.608.

41. Ibid, p.609.


43. Ibid.

44. Ibid, p.554.

45. Ibid.


47. Ibid.


49. Ibid.


53. Ibid.


56. Ibid, p. 794.


58. Ibid.


61. Ibid.

62. Ibid.

63. Ibid, p.839.
64. Ibid, p. 341.


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