

A  
COMPARISON OF  
CHINESE AND SOVIET  
AGRICULTURAL SYSTEMS

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When Karl Marx called for the workers of the world to unite, he never charted a course of action for them to follow after the revolution was successful. This task was left to Lenin and Stalin in the Soviet Union and to Mao in China. Although they started from the same Marxist premise and the Chinese adopted the Soviet model during the 1950's, the Soviets and the Chinese have since ventured separate ways. The current Chinese leadership by implementing the current economic reforms has continued to pursue a path that is quite different from the Soviet system. Focusing on agriculture, a partial comparison of the two economic systems can be drawn.

Since 1978, the Chinese have successfully implemented economic reforms in agriculture while the Soviet Union, although paying lip-service to reforms or system modifications designed to increase production, has mostly continued with the status quo. In comparing these two agricultural systems, this paper will be divided into three main sections. The first section will briefly touch upon the historical background leading up to the current systems. The second section will compare the nature and structure of the systems. The third section will discuss the performance of the two systems.

## I. Historical Background

### Soviet Union

Contemporary Soviet agriculture began in 1929 with Stalin's

collectivization effort. Because of delivery and other problems during War Communism and the New Economic Policy, collectivization was deemed necessary to provide the necessary agricultural resources to the Soviet industrialization effort. Because the process was coercive in nature, costs were high; rather than surrender their livestock to the state without compensation, the peasants chose to slaughter their livestock for personal consumption. The result was a sharp decrease in harvests and large scale starvation in Soviet rural areas.

In the collective, the peasants no longer owned the land; instead, they work land owned by the state<sup>1</sup>. They are not paid an hourly wage; instead, their income is derived from any profits remaining after the harvest is in and costs are paid<sup>2</sup>. The state assigns each farm a production quota to be turned over to the state during the harvest. Any surplus could also be sold to the state. Also characteristic of Stalin's rule are the Machine Tractor Stations (MTS). One reason for the MTS's was that because mechanized farm machinery was scarce, pooling all machinery in one location was more efficient. The MTS's however also served as political and economic control. By direct control of the MTS, the state was able to tell the collective what to plant and when.

After Stalin's death and Khrushchev's assumption of power, the Soviet Union, to provide production incentives, increased the prices paid to farmers for grain purchases. The most visible manifestation of Khrushchev's tenure, though, is the opening of

the Virgin Lands, an effort to increase grain production by plowing previously unused land in the Kazakstan region. Another visible action of Khrushchev was the abolition of the state run Machine Tractor Stations (MTS). Also characteristic of Khrushchev's tenure was an emphasis on increased corn production for feed. For a variety of reasons, including the crop failures in 1963 resulting partly from the campaign to increase corn production, Khrushchev was replaced in 1964 by Brezhnev.

Brezhnev's tenure was characterized by the expansion of state investment and continued increases in procurement prices paid to Soviet farmers. In addition to higher prices and increased investment, efforts have also been undertaken to specialize production by creating inter-farm cooperatives and agro-industries, the horizontal and vertical integration of several farms with related production activities such as livestock production or food processing. Since the late 1970's, reforms have been contemplated and discussed in the Soviet Union, but implementation has been limited and uneven varied<sup>3</sup>.

## China

During the civil war and following the Communist victory in 1949, the People's Republic of China carried out a policy of land reform. Peasants were given a class label and land taken from peasants labelled as "landlords" and "rich" was given to peasants labelled as "poor." After the economy had recovered from the war, the government encouraged the peasants to participate in

Mutual Aid Teams as a preliminary step in collectivization.

During the late 1950's, efforts to persuade the peasants to collectivize were stepped up, and collectivization was completed by 1956. The collectives are made up of three parts. The smallest unit in the collective is the production team and consists of approximately 34 households. The brigade is made up of an average of 7 teams, and the commune averages 15 brigades<sup>4</sup>.

During the Great Leap Forward (1958-60), the policy was to do everything communally: labor, eat, and live. Also characteristic were efforts to rapidly develop industry on a widespread, small-scale basis. In this effort to develop industry, the collectives were assigned excessive quotas while at the same time agricultural production was neglected to develop industry. The collectives were also expected to expand their agricultural production using some untested or inappropriate methods, and feasible methods were used to such an excess that they were counterproductive. As a result of the Great Leap policies, there was extensive economic dislocation and widespread famine. The government responded by calling a halt to the Great Leap, replaced the commune with the production team as the basic unit of accounting, and adopted a policy of "agriculture first." After the recovery from the Great Leap and during the Cultural Revolution, a campaign of self-sufficiency (beginning 1965) was launched.

During the self-sufficiency campaign, regions were expected to make themselves self-sufficient in grain production before

they were allowed to cultivate other crops. Land that was previously used for sugarcane, animal husbandry, or other use was diverted to grain production. By diverting land that was better used for other agricultural purposes to grain production, poor grain growing regions became poorer relative to the good grain growing regions, and good grain growing regions are able to become wealthier by diverting land from grain to cash crops. Because of political strife and economic problems, there was a change in the political leadership in 1978, and a series of economic reforms were begun.<sup>5</sup>

## II. Nature and Structure of Systems

In comparing economic systems, there are four aspects of the different systems to examine: (1) the information structure, (2) the decision-making structure, (3) the coordination structure, and (4) the motivation structure<sup>6</sup>. Because both the Soviet Union and China are run by the dual and often over-lapping structures of the government and the Communist Party, I will acknowledge that the Party exerts control, but will only deal with the governmental structures<sup>7</sup>.

### Information Structure

The information structure is the gathering and processing of information by various entities within the economy. It will parallel the institutional make-up of the economy. In a market economy, information is usually transmitted to and from consumers

and producers by using the price structure. Additional information may be provided by governmental channels or research reports. Although some market prices may also exist in a centrally-planned economy, information is usually transmitted from factories to government officials in the form of quota fulfillment or a report and proceeds up the governmental hierarchy to the appropriate destination. Information, often in the form of plans, directives, or rationing, also passes down the hierarchy to individual producers and consumers.

In the Soviet Union, information is usually transmitted up and down the governmental hierarchy. Gosplan, the state planning agency will have the Central Statistical Administration (CSA)<sup>8</sup> gather information to formulate the plan<sup>9</sup>. The CSA is the main information gathering body in the Soviet Union. It has sub-bureaus at every administrative level and its tasks are (1) develop statistical methods, (2) provide statistical leadership and direction, (3) take an accounting of the national plan, (4) take a national census, and (5) publish data<sup>10</sup>. Because the planning process also provides special surveys and reports to various ministers and government officials, the CSA also gathers other requested information.

Information tends to be aggregated as the various firms, factories, and farms report their output. Information dealing with the productivity of a single firm, farm, or method is often unavailable. This informational shortcoming results from the methods apparently used in both information gathering and in

planning.

The various governmental ministries will be asked for their consumption needs and production abilities. The ministries will then obtain this information from the various sub-ministries who will in turn ask subordinates until firm managers are asked to provide the information. In the case of agriculture, the Ministry of Agriculture will be asked for the amount of grain, livestock, and other agricultural produce it can provide. The Ministry will also be asked the amount of fertilizer, machinery, and other resources it requires to reach a given output level. The Ministry will ask the various sub-ministries to provide the information until the collective farms (kolkhozy) and state farms (sovkhoz) are asked.

The farm managers then provide the requested information to their immediate superiors. The information from each individual farm is then aggregated and transmitted upward. Eventually the Ministry of Agriculture receives the total and provides it to Gosplan.

Gosplan, after having developed the plan, notifies the Ministry of Agriculture of the amount of resources available and a production target. This quota will be broken down to the various sub-ministries and in turn redivided until each individual farm receives its quota and available inputs. In addition to the Ministry of Agriculture, Gosplan provides the State Commission for Supply of Agricultural Machinery with a quota for farm machinery and the State Commission for Supply of



Agricultural Chemicals with a mineral fertilizer quota<sup>11</sup>. The Ministry of Procurements is also told how much agricultural produce it is expected to purchase from each farm and store for the upcoming year<sup>12</sup>.

In addition to the information structure surrounding the plan, there are agricultural markets in the Soviet Union that operate outside the plan, and , hence, use a traditional market oriented information structure. Peasants use prices to determine what and how much to produce on their private plots. Buyers also use prices to acquire information such as the availability of goods.

Because the Soviet model was originally adopted by the Chinese, there are many similarities. The State Statistical Bureau (SSB) and State Planning Commission (SPC) work to form the plan. Information is transmitted up and down the hierarchy by the State Statistical Bureau. To obtain agricultural information, the SSB uses two methods of information gathering<sup>13</sup>. The first is the surveying of communes, brigades, and teams from some of the counties in each province to obtain statistical information for the agricultural sector. The second method is to ask each team in each commune to provide production information for the aggregation of production and development<sup>14</sup>.

In addition to the SSB work, various ministries also will develop and publish information. These works are often done independently of the SSB. Work is also done by various communes to obtain local or regional information<sup>15</sup>.

Using the same structure, information is also transmitted. After the plan is formulated, information is given to the various ministries in the form of plans and quotas. This information is then broken down and dispersed to the various regions and then the various communes.

Since the reforms of 1978, there has also been a significant increase in the use of market oriented information channels, especially in regard to non-grain production. Consumers are able to determine availability of produce by the prices on the free markets, and peasants, in turn, are able to determine demand for various types of produce. This is also true of grain output, but because the state continues to procure much of it and still issues ration tickets, the market based price information is partially distorted by a non-market influence.

#### Decision-Making Structure

The purpose of the information structure is to enable the decision-making structure to function. In the decision making structure, accumulated information is used by various economic entities to make a consumption or production decision. In a market economy, the decision structure is very decentralized and decisions are often made by individual producers and consumers. In a centrally planned economy, decisions are usually made by officials in the hierarchy or some sort of central agency.

Although it is essentially correct to say that Soviet agricultural decisions are a part of the Ministry of Agriculture,

it is a bit oversimplified. Goals are formulated by the Communist Party of the Soviet Union (CPSU) and translated into a plan by Gosplan. Once the plan has been worked out, it is given to the various ministries; they, in turn, make production decisions for the various entities. In the case of Agriculture, crop targets are set by the Ministry of Agriculture while tractor output and fertilizer output decisions are made for their appropriate agencies.

Although most production decisions and many consumption decisions are made by the state, to increase agricultural growth, several changes have been proposed. The first alternative is to institute the link (zveno) system. The link is a small (3-8) group of people that assumes responsibility for a small area of land. The group cultivates the land and is compensated according to the success of their efforts. It has been quite successful in the past, but is politically unpopular and unlikely to be readopted in the near future.

The change or reform currently being attempted (announced about 1976) is agro-industrialization. In this system, several farms attempt to merge their resources and specialize in production. Usually several farms will decide to specialize in their primary form of output, but because they have been assigned quotas for several different type of output, they will continue their secondary production on an individual basis. As a result, 90% of the farms have beef targets and dairy cattle, and 87% of the farms have grain targets<sup>16</sup>.

Soviet individuals also make decisions. Agricultural markets allow consumers to acquire non-state produce and allow peasants to produce outside the state plan. Some labor allocations are made by the individual instead of the state. Because the private plot produce in these markets fetches a higher price, a conflict would seem to arise between the allocation of an individual's labor to the private plot and to meeting the plan. Instead of having the state mandate that the peasants work state land for a specified period before allowing them to work their private plot, it seems the peasants have decided to provide adequate labor to the state.

There seem to be two reasons. Since much of the feed for livestock on the private plot comes from the farm, peasants work the farm in order to guarantee an adequate amount of feed<sup>17</sup>. Also, there seems to be a division of farm labor in the Soviet Union. Men tend to work in the fields while women are divided into two different groups. One group of women will do work on a seasonal basis, usually the harvest or planting, while the other group will work on a regular basis in a specialized area. The former group of women have time to work the private plots<sup>18</sup>. Also, because collective farm work often tends to be physically arduous while private plots tend to be garden like in nature, the elderly and children tend to work the private plots.

As in the Soviet Union, the Chinese Communist Party establishes goals and the SPC translates them into a plan. There are also a couple of differences in the pre-reform systems. In

China, the preliminary plan is subject to more review and input by lower levels<sup>19</sup>. The other difference is that in China the plan is much more specific on the amount of acreage to be devoted by a commune to a specific crop. Whereas the Soviet Union has occasionally directly determined cropping quotas, over 75% of China's cultivated land was subject to cropping quotas<sup>20</sup>.

Since the reforms, the decision structure has become much more decentralized. Since the Responsibility System was adopted, the state no longer makes the cropping decisions. Instead, the responsible unit as determined by the type of Responsibility System being used makes the decisions.

There are about five different implementations of the "responsibility system"<sup>21</sup>. The first is a strong reliance on the collective. The collective unit is responsible for meeting the state plan as it sees fit. Individuals are not the decision makers. The second implementation makes the Brigade secondary and the team is primary. In this implementation, the work teams break into groups and become responsible for insuring production. The third method breaks everything down to the household unit and individual households are responsible for production. In the fourth practice, the Brigade retains ownership of factories and orchards, but all land is divided amongst the various households. The final method is to have the Brigade contract jobs out to those individuals who wish to bid. In this method, individuals will assume brigade's responsibilities, but not all individuals are required to assume responsibilities.

In the "Responsibility System" the responsible unit makes the decisions for investment, acreage planted, and crops planted. Although the responsible individual is still constrained somewhat, a required contract with the state, there has been a change in the nature of decisions. For example, after plots were divided up amongst various households, there was a significant drop in the demand for mechanized services as the peasants realized that tractors weren't feasible<sup>22</sup>. Also, as the peasants realize that labor has a diminishing marginal return, many workers are beginning to find non-agricultural occupations<sup>23</sup>.

#### Coordination Structure

The coordination structure is the means in which the various decisions being made are coordinated. There are three ways in which decisions are coordinated: tradition, market, and plan.<sup>24</sup> In a traditional system, decisions are made a certain way because they always have been made a certain way. In a market system, decisions are coordinated by Adam Smith's "invisible hand." In this system, individuals make decisions on what they determine to be to their advantage. In a planned system, decisions are made to insure the fulfillment of the plan as established and coordinated by a central agency.

In the Soviet Union, coordination is done by the plan. Gosplan is the specific agency assigned responsibility for coordinating the plan. By translating the CPSU goals into a physical plan, allowing the various ministries to comment on the

preliminary plan, and correspondingly adjusting the plan, Gosplan is able to insure that a coordinated and balanced plan is generated. There also exists some production outside the plan in the Soviet Union. This takes place in the farmer markets and on the private plots. Although it may currently be dropping a little, this agricultural production occurring outside the plan accounts for about 30% of Soviet agricultural output<sup>25</sup>.

In China, production was, until 1978, plan dominated. However, since the reforms, markets are taking a much larger role. Plan quotas are met by negotiated contracts with individuals or other responsible units, and production above the quota is purchased at a higher price. Farmers are allowed to market their excess produce on free markets. Marketing systems are beginning to develop<sup>26</sup>. Although the market is playing a larger and larger role in the coordination of the agricultural economy, it needs to be noted that urban food prices are still subsidized, indicating that the state continues to play a large role in economic coordination.

#### Motivational Structure

The Motivational, or Incentive, structure is the means by which decisions are influenced in order to obtain the desired result. One entity will use the motives or incentives of another entity to insure that the second entity acts in a manner desired by the first entity. In a market system, prices and profits are used. Consumers purchase items at prices that allow producers to

recover their costs and make a profit. Producers sell their products at a price that consumers can pay and increase their utility. In a planned system incentives can be material bonuses, nonmaterial honors, or some sort of enforced penalty for non-compliance.

The Soviet Union uses a combination of material and non-material incentives. Bonuses are paid to managers and workers who attain and surpass their quotas. Advancement and promotions are also handed to those who meet their quotas; conversely, sanctions and dismissals can be used against those who fail. In agriculture, the Soviet Union has tried to increase production by increasing the price paid for grain purchases. In addition to higher prices, benefits have also increased: farm workers have gained increased access to medical facilities and pension funds.

Beside the increased prices and benefits, the linkage between state land and private plots has contributed to the motivation of agricultural workers. As mentioned earlier, much of the feed for livestock raised on private plots is grown on collective or state land. Workers who don't work on the collective's land can be denied access to the needed feed. Also, since the collectives and state farms often purchase livestock raised on the private plots<sup>27</sup>, the purchase of the livestock can also be used as an incentive to encourage workers.

In China, the use of material incentives has tended to be discouraged at times. During the Great Leap Forward and parts of the Cultural Revolution, the use of material incentives was



attacked as being "capitalistic" or a part of the "reactionary old society." Instead of material incentives, promotions and role models were used to encourage production. However, production often stagnated. To prevent and counter stagnation, the collectives adopted a system of work points that became worth a certain amount of money based upon the total number of work points allocated during the year and the amount of profit available after costs had been accounted for. Usually work points were assigned to individuals based on the amount of work accomplished or based upon the nature of the task performed. One exception, however, is the Dazhai model brigade. In this system work points were assigned by peer appraisal in group meetings<sup>28</sup>.

### III. PERFORMANCE

A complete comparison of the Chinese and Soviet agricultural system requires some sort of performance comparison. How well do the two systems work? In comparing two economic systems, one must realize that different political power structures have different economic objectives and that some objectives can adversely affect other objectives. However, realizing that economic priorities may differ, the following criteria may still be used to compare the performance of the two agricultural systems: (1) Economic growth, (2) Efficiency, (3) Income distribution, (4) Stability [cyclical stability, inflation, unemployment], (5) Development objectives, and (6) Continuation of national existence<sup>29</sup>.

## Economic Growth

"Economic growth refers to increases in the volume of output that an economy generates over time or to increases in output per capita."<sup>30</sup> In agriculture this growth is expected to come from crop or livestock production, but it can also come from sideline production. If per capita food consumption is at or near subsistence level, then an increase in crop production is relatively important. However, when per capita food consumption is adequate, then economic growth may come from sideline activities such as forestry, cottage industry, or local light industry. Also, as diminishing returns take effect in crop production, sideline activities are going to emerge as the source of economic growth in agriculture.

Before continuing with a comparison of system performance, it should be noted that both the Soviet Union and China have especially serious constraints in their ability to increase agricultural output because of limited agricultural endowments<sup>31</sup>. In both countries, the amount of cropland available is limited and the weather is often uncooperative. In the Soviet Union, for example, "30% of the land is too cold for agriculture and 40% is so cold that only hardy, early maturing crops can be grown."<sup>32</sup> Also, rainfall in the Soviet Union is variable, and as the average annual precipitation decreases, the variability increases<sup>33</sup>. In China, "there is too little cultivable land, and much of it is marginal and suffers from recurrent drought, flood,

poor soil and cold."<sup>34</sup>

In spite of its weather constraint, Soviet agriculture has successfully increased agricultural output. Gross agricultural output grew 34% between 1966 and 1975, including a 29% increase in grain between 1966 and 1970<sup>35</sup>. Meat consumption also doubled in a 25 year period<sup>36</sup>. Growth since 1978 has been much lower. In spite of the progress and growth, the Soviets are unhappy with their agricultural growth. The increases in production haven't been satisfactory. Large increases in procurement prices and investment haven't produced a comparable increase in productivity and output.

Soviet sideline production doesn't seem as widespread as in China. The agro-industrial complexes are efforts to specialize in sideline production, but they tend to be limited to food processing. There is some limited sideline production by the peasants that is sold in the peasant markets, but the constraints on this production are fairly extensive. Only items made within the household selling the product are allowed to be sold.

China's agricultural sector, like the Soviet Union's, has experienced economic growth. Between 1952 and 1978, gross agricultural output value increased by about 130%<sup>37</sup>. In spite of the substantial growth, food consumption per capita remained the same between the mid-1950's and late 1970's<sup>38</sup>. In the post 1978 period, Agricultural output has accelerated and allowed per capita consumption to also increase<sup>39</sup>.

The recent increases in crop production have been caused by

two factors allowing an increase in productivity growth. The price reforms have encouraged the peasants to increase their production and market it. Reorganization of production has also contributed to the increase. Farmers are able to decide what crop to plant, how much of it to plant, when to plant it, and where to plant it, allowing the farmers greater efficiency in planting. Individual farmers are also better able to decide upon an appropriate investment level<sup>40</sup>.

In spite of the recent success, a major question facing the Chinese agricultural system is the extent to which crop growth can continue. Without new technology, such as new high yield varieties, increases in crop output will slow as increases from factor productivity reach their maximum. It is also important that the technology be yield increasing: new technology that is labor saving will not provide the needed output growth; instead, the labor will just be more efficient, creating a potentially major unemployment problem.

In addition to food production, sideline activity has also increased significantly. Although sideline production had increased dramatically up till 1958, the increase from 1978-82 was about 58%<sup>41</sup>, and compared to the Soviet collectives, Chinese sideline production is quite extensive. In addition to activities such as forestry, Chinese sideline production also includes industry.

Rural industry was first promoted during the Great Leap. After its failure, promotion of the "five small industries"

ensued. The five small industries--iron and steel, chemical fertilizer, farm machinery, cement, and energy--are usually administered at the county or commune level<sup>42</sup> and are responsible for much of rural industrialization. Since the reforms, they have been supplemented by cotton spinning, knitting, sugar refining, cigarettes, and wine making<sup>43</sup>.

Economic growth in sideline production can be expected to continue. In the Chinese tradition of role models, China Daily often contains articles about successful peasants using their profits to build a new enterprise. Also, 59% of current (1978-82) profits are being invested on farm and non-farm projects<sup>44</sup>. Because these enterprises are outside the scope of the state plan, they can be expected to continue as long as they are profitable and the political climate is conducive to enterprise activities.

### Efficiency

"The concept of efficiency refers to the effectiveness with which a system utilizes its available resources (including knowledge) at a particular point in time (static efficiency) or through time (dynamic efficiency)<sup>45</sup>. An economy in a state of static efficiency will be producing along its production possibilities frontier. An increase in the production of one item cannot occur without a decrease in the production of another item. Dynamic efficiency involves the ability to push the production frontier outward.

Although it is difficult to empirically measure, there is evidence to suggest that the Soviet system could be made more efficient. Because state purchase prices of agricultural products are higher than consumer prices, the state pays a food subsidy. Resources that could be used more productively are used to allocate the subsidy. There is also waste in the farming process. It is estimated that annual waste averages 20-25% (more in good years) because of poor processing, poor transport facilities, poor storage facilities, and poor marketing channels<sup>46</sup>. Improvements in any of these conditions will effectively increase agricultural output. Inputs are also inefficiently used. Transport facilities that are unable to ship produce from the farms are unable to bring fertilizers to the farms. Also, because it has been poorly stored and handled, fertilizer that reaches its destination has usually deteriorated substantially.

Dynamic efficiency is also hampered by the Soviet system. Efforts to specialize are hampered by a plan that requires all farms to produce a variety of crops. Also no incentives exist to develop or adapt new methods of production. Since workers are assigned a task and have no direct stake in how it is done, how well it is done, or how long it takes, they will stick to existing methods. There have been proposals to increase Soviet efficiency, but a variety of roadblocks cause them to fail.

Chinese efficiency is also less than optimal, but it appears to be increasing. It is noted that the increase in output since

1978 has been because of an increase in factor productivity<sup>47</sup>. Since grain production has increased while meat and vegetable production has also increased, it appears as though the Chinese agricultural system wasn't producing along its production frontier curve.

However, in spite of increased efficiency, there still exist problems in China. Like the Soviet Union, the Chinese subsidize their food production, and transport facilities need to be improved. Also dynamic increases in production are lagging. In rice production, for example, hybrid rice varieties introduced in the late 1970's are only used in about 15% of sown area<sup>48</sup>

#### Income Distribution

Income distribution involves the determination of what percentage of the population has a given percentage of the national income e.g. is 5% of the income earned by 50% of the population or do 5% of the people earn 50% of the income? It is measured using a Lorenz curve and the Gini coefficient.

Although politicians, social darwinists, social workers, and others may disagree on what an optimal income distribution is, for the purposes of this essay, one of Marx's adages will suffice: "From each according his ability, to each according to his need." Although neither China nor the Soviet Union consider themselves to be true communist states, we would expect them to strive toward lower Gini coefficients or more equal income distribution.

In the Soviet Union, there is a definite gap between the urban and rural sectors. It is estimated that current rural incomes are approximately 65-75% of urban incomes<sup>49</sup>. This is closing of an earlier gap but is still less than the Marxian ideal. There also exists an income gap between state farms and collectives; however, as the differences between the state farms and collectives disappear, so do the income gaps.

China, too, has income discrepancies. Average net income per capita for the peasants in 1982 was 270.11 RMB/year<sup>50</sup>. The city equivalent is 535.32 RMB/capita indicating a larger gap than the Soviet Union. Although the gap is large, it is a percentage decrease from the previous year (463.68-city and 223.44-rural).

In addition to the urban/rural gap, there is an inter-provincial gap in China. While the average living expenditure per capita (1982) is 220.23 RMB, the values range from a high of 444.64 RMB in Shanghai to a low of 152.66 RMB in Qinghai province<sup>51</sup>.

The reforms have had mixed results in lessening these gaps. As the peasants are able to pursue different economic endeavors, their incomes will increase. However, while decreasing the urban/rural gap, the reforms are likely to cause the inter-provincial gap to worsen. The inter-provincial gaps appear to have lessened in the short run, but that will probably change. The Responsibility System was originally adopted in the poor provinces to improve their relative situations. They were successful. But, because they were successful, the system spread



nationwide. Consequently, those provinces that have greater factor endowments are fully able to develop them, and as the richer provinces continue to develop, the gap between rich and poor provinces can be expected to increase.

### Stability

Stability is the "absence of significant fluctuation in growth rates, the maintenance of acceptable rates of unemployment, and the avoidance of excessive inflation<sup>52</sup>." In a centrally planned economy, one of the purposes of the plan is to provide stability. However, in the planned economies, efforts to develop rapidly have caused regular supply shortages and much instability<sup>53</sup>. In spite of supply shortages, the planned economies tend not to have the inflationary and unemployment problems of capitalist countries. Instead, goods tend to be rationed, and workers are more likely to be underemployed. This does not mean, though, that planned economies are immune to inflation and unemployment. Both China and the Soviet Union have unemployment problems, and China recently has had to retrench the reform movement to cope with a bout of inflation.

Soviet agriculture has experienced instability. The instability often results from poor weather or from a poor supply of inputs. Fertilizer often fails to reach its intended destination or suffers significant deterioration in route. Spare parts for tractors and machinery are also scarce. It is not unheard of new machinery to be purchased for use as spare parts.

The Soviet Union also experiences a labor problem during peak agricultural seasons. During these periods, many workers are brought to the countryside from the cities to help out<sup>54</sup>.

China's recent history is also characterized by instability. The current government is seeking to insure stability, but it has inherited the remnant chaos of the Great Leap Forward and the Cultural Revolution. During these periods, there was widespread displacement within the economy. It should be noted, though, that the Chinese collectivization campaign was much less disruptive than its Soviet counterpart. To reverse this past, the current reform efforts have taken two actions. The first action is to separate governmental duties from party activities in an effort to prevent disruption from party movements. The second action applies directly to agriculture. It was discovered that short term leases were causing the peasants to exploit the land and sacrifice long run production for short run gain, so leases were extended to 15 years.

In spite of disruptions caused by party campaigns, grain output has been relatively stable. Compared to other important grain producing nations, China's total production is stable<sup>55</sup>. Using import purchases as a guide, China also seems to be more stable than the Soviet Union<sup>56</sup>. The reforms have also allowed a stable means of absorbing surplus rural labor. Given that the Chinese wish to decrease the percentage of people employed in agriculture<sup>57</sup>, it is significant to note that "the number of workers employed directly in farming activities has shrunk<sup>58</sup>."

## Development Objectives

In socialist countries such as the Soviet Union or China, there has been a large emphasis on economic development, and agriculture plays a central role. Agriculture's contributions to development are (1) expanded food supplies to meet increased demands of the non-agricultural sector, (2) increased agricultural exports to supply foreign exchange, (3) supply of labor for industry, (4) provision of investment capital for industry, and (5) rising farm incomes to provide an industrial market<sup>59</sup>.

Soviet agriculture has been generally successful in providing for Soviet economic development. Food supplies, although not of the desired composition, are adequate for Soviet diets. Through 1971, the Soviet Union was able to maintain net exports<sup>60</sup>. Labor, excepting current peak period needs, was released for use in industry. Also, because of the "squeezing" policy, capital was acquired to invest in industry.

The final contribution of Soviet agriculture to economic development may be somewhat limited. Because agricultural produce was purchased at very low prices, farm incomes didn't rise and provide a market for industrial output. Recent farm income increases have provided a market, but there is a possible limiting factor. Because many consumer products are still scarce, recent farm income increases may lead to a cut back in the amount of time worked<sup>61</sup>, preventing parallel increases in purchases of

industrial goods.

In spite of a potentially limited consumer market, there is an agricultural market for industry. As the Soviet Union developed, agriculture provided linkages to industry by providing a market for machinery and fertilizer. Storage and transport facilities also provided markets for industrial produce.

Unlike Soviet agriculture, Chinese agriculture has served to constrain development. As noted earlier, food supplies are limited, so supplies for the non-agricultural sector have been limited. Although labor is currently being gradually released from farm work, most of the population is still in agricultural production. The available surplus from agriculture is limited. Efforts to obtain a large surplus during the Great Leap were very costly and led to much turmoil. Since farm incomes are very low, industrial markets in Chinese agriculture are limited.

Although Chinese agriculture has hampered industrial development, it has provided some support. China has generally maintained an agricultural trade surplus. The reforms have also resulted in several changes in historical trends. Increases in output have expanded food supplies and profits from agriculture are being invested in non-farm activities. As peasant incomes rise, the peasants have acquired a taste for consumer goods. Chinese agriculture, like its Soviet counterpart, has provided markets for machinery and fertilizer.

## National Existence

Preservation of national existence requires that necessary resources be allocated to repel threats to the continued existence of the nation. Threats can be internal or external. External threats require resources be allocated to military and political structures. Internal threats arise when the people of a nation feel as though the current situation is unbearable, so efforts need to be made to keep prevent civilian and military restlessness.

In the case of both the Soviet Union and China, the economies are sound. Although the economies of both countries have problems, most of the basic needs of the citizens are provided. Resources, in both countries, have been allocated to provide the population with basic needs--guaranteed food supplies, housing, and medical services. Both countries also realize a need to provide citizens with more consumer goods and have undertaken efforts to do so. The Soviet Union is trying to increase meat production, and China has allowed free markets to flourish.

## Conclusion

This paper is an effort to compare the agricultural systems of the Soviet Union and China. It has focused on the historical backgrounds, nature and structure, and performance of the two systems.

It is obvious that the histories of the two systems are

quite different. In addition to significant cultural history differences, the two countries have followed different courses since their respective communist parties have come to power. The Chinese have been more willing to experiment with very different policies. While the Soviets have worked within the collective farm framework, the Chinese have experimented with both the collective system and individual production systems.

Although the histories are quite different, the nature and structure of the systems is quite similar. Because the Chinese originally adopted the Soviet model, much of the two systems are the same. In both nations, the Communist Party establishes goals that are then formulated into a plan by a central agency. Both countries have a central statistical agency responsible for procuring information. And both systems have used a system of compensation for collective workers based upon the total amount of work provided by the collective labor force, the amount of the collective's profit, and the amount of work provided by each individual worker. The profit is divided by the total amount of work provided and then each individual receives a share based upon the amount of work he or she provided to the collective.

There are differences in the systems, though. While the plan plays a larger role in the Soviet Union, markets play a relatively a larger role in China. The Chinese are allowing profits to play a larger role in production and the state is now working with individual households instead of the communes. The Soviets allow private plots and limited marketing but consider

them to be secondary to planned production.

In the course of comparing the performances of the two systems, the question of which system performs better arises in one's mind. Although it is a valid question, it won't be answered within this essay for several reasons. First, some sort of handicap for the Chinese system needs to be developed. Soviet development is more advanced and an allowance of some sort would need to be made. Secondly, a value weight would need to be calculated for each of the performance criteria. Since a different set of weights would change the results, a determination of the "correct" value weights needs to be made. Finally, since different governments will pursue different priorities, weightings will differ between countries. The resolution of these three issues is beyond the scope of this particular project.

Although an overall performance isn't feasible, we can look at each of the performance criteria and examine the relative performances.

Both countries have weather constraints in their abilities to increase agricultural output. In spite of this constraint, both have successfully increased output. The Soviet Union was more successful in increasing agricultural production until 1978. The growth allowed Soviet meat consumption to increase, indicating that production is above the subsistence level and that agricultural growth was greater than population growth. China's agricultural output also grew during this period, but

failed to increase per capita consumption. Since 1978, China's growth has been more successful. While Soviet growth has slowed, China's growth accelerated, and Chinese per capita food consumption increased significantly.

Both countries also have agricultural sideline production. Although it is difficult to find figures on Soviet production, it doesn't seem to be very large. Private production is severely constrained by marketing regulations. Sideline production at the collective level also tends to be constrained. Chinese sideline production, on the other hand, is quite widespread and developed. The Chinese have encouraged the development of rural industry since the Great Leap Forward. The recent reforms have removed nearly all constraints on peasant economic activities, so recent sideline growth has been widespread and significant.

Both countries appear to have economic inefficiencies. In the Soviet Union, there is anecdotal evidence to suggest system inefficiency--annual crop wastage averages 20-25% and sugar beet content is lowered because of early harvesting. The recent increases in Chinese agricultural production also imply the system hasn't been operating efficiently. The output increases were because of increased factor productivity and not new technology, nor did the increases in agricultural production cause decreases in other forms of production.

Both countries have rural/urban income gaps. Soviet rural income is approximately 75% of urban income; in China, rural incomes are approximately half of urban income. In both



countries the gap is closing. However, in China there is a regional gap that may be increasing. Chinese provinces that have better resource endowments are better able to capitalize (no pun intended) on market opportunities. As these provinces successfully exploit the opportunities, their income can be expected to grow faster than the poorer provinces.

Both countries have experienced instability, but the type of instability has been somewhat different. Soviet instability tends to come from a poor input supply. Equipment is often unusable because of a lack of spare parts, or crops go unfertilized because transport facilities are inadequate to ship fertilizer to the farms. Although the Chinese have also experienced this type of instability, political movements have tended to be more destabilizing. Both the Great Leap Forward and the Cultural Revolution were chaotic. The current government, however, is working to prevent future disruptions.

Soviet Agriculture has been more successful in contributing to economic development than Chinese agriculture. Much of this stems from the fact that the Soviets have an agricultural surplus. Because of this surplus, agriculture did not constrain Soviet industrialization. Chinese agriculture, however, has<sup>62</sup>. Although both country's agricultural systems have had trouble providing some of the listed contributions to development, the Chinese have experienced more troubles. If, however, the Responsibility System's success continues and the peasants continue to have economic freedom, then future Chinese

agricultural contributions will probably be very significant. Soviet Agriculture, if it continues to slow, will likely make fewer contributions.

Both countries seem to have sufficient resources to continue their national existence. None of the shortcomings in each of the two agricultural systems is sufficient to bring about the turmoil necessary to threaten national existence. However, the food subsidies in both countries are large enough that eliminating them without some other compensation, such as a wage increase, is likely to cause some significant disturbance.

In examining many of these performance criteria it appears as though the Soviets have historically performed better. Recent Chinese advances have undermined the Soviet advantage, however, and it is impossible to say that Soviet agricultural system is a clearly superior system. It is quite certain that using the current systems and outputs and varying weighted values for the performance criteria would produce varying results.

#### Notes

1. Collectives are not the same as the State Farms. In a State Farm, the farmer is considered an employee of the state, receives a monthly wage, state health services, and a pension. Income is not dependent upon the amount of output. Because the number of State Farms is increasing as collectives are incorporated into the state system and collective workers are beginning to receive the same benefits as state farmers, the difference is becoming minimal and won't be dealt with any more.

2. The number of hours worked by a collective farmer every day is recorded. Any profit is then divided by the total number of hours worked by all of the collective farmers to derive an hourly rate. The number of hours a farmer has worked is multiplied by

the rate to derive his or her annual income.

3. For additional background on the Soviet system see Robert C. Stuart, ed., The Soviet Rural Economy (Totowa, N. J.: Roman and Allenheld, 1983); Alec Nove, The Soviet Economic System, 2nd ed. (London: Allen and Unwin, 1981); or Harry G. Shaffer, ed., Soviet Agriculture: An Assessment of its Contributions to Economic Development (New York: Praeger Publishers 1977)

4. Chinn, Dennis L., "Income distribution in a Chinese Commune," Journal of Comparative Economics, 2(3), September 1978, pp. 246-265, p.246.

5. For additional information on Chinese agriculture one can seek out the following sources. For a personal observation of one village see Hinton, William, Fanshen (New York: Random House, 1966) and Shenfan (New York: Random House, 1983). For broad based background see Barker, Randolph; Sindha, Radha; and Rose, Beth, ed, The Chinese Agricultural Economy (Boulder, Colorado: Westview Press, 1982). For specific analysis of Chinese Agriculture see Tang, Anthony M., An Analytical And Empirical Investigation Of Agriculture In Mainland China, 1952-1980 (Taipei, Taiwan: Chung-Hua Institution for Economic Research, 1984).

6. The decision-making structure, information structure, and coordination structure were first developed as a comparison scheme in Neuberger, Egon, and Duffy, William, Comparative Economic Systems: A Decision-Making Approach (Boston: Allyn and Bacon, Inc., 1976). Motivation is added and the other three are further developed by Neuberger in "Classifying Economic Systems," Bornstein, Morris, ed., Comparative Economic Systems: Models and Cases (Homewood, Illinois: Richard D. Irwin, Inc., 1979) and Conn, David in "The Evaluation of Centrally Planned Economic Systems: Methodological Precepts," Zimbalist, Andrew, ed., Comparative Economic Systems: Present Views (Boston: Kluner-Nijhoff Publishing, 1984).

7. The reasoning for this is two-fold. One reason is clarity and expedience. By developing and merging both the governmental structure and party structure, it becomes confusing and far too easy to begin comparing government and politics instead of comparing the agricultural economics of the two countries. The second reason is that as part of the reform effort, the Chinese have tried to undo the merging of government and party and are separating party duties from governmental duties.

8. The Central Statistical Administration has also been translated as the Central Statistical Directorate or Central Statistical Bureau. Its Soviet acronym is TsSU.

9.Hedlund, Stefan, Crisis in Soviet Agriculture (New York: St. Martins Press, 1984), p.19.

10.Krylov, Constantine A., The Soviet Economy: How it Really Works (Lexington, MA: D.C. Heath & Co., 1979), p. 67.)

11.Hedlund, pp 17-19

12.Hedlund, pp.17-19.

13. Stone, Bruce, "The Use of Agricultural Statistics: Some National Aggregate Examples and Current State of the Art," Appendix A, in Randolph Barker et al., ed, The Chinese Agricultural Economy (Boulder, Colorado: Westview Press, Inc., 1982), p.207.

14.According to Stone (1982, p. 207), however, the teams often don't have the information necessary to fill out the survey information, implying that the information is filled out by the commune and some of the figures are estimated by commune accountants. Consequently, the SSB prefers to rely on the stratified surveys that provide more control.

15.Stone, Bruce, p.207.

16.These are 1979 figures. Litvin, Valentin, "Agro-Industrial Complexes: Recent Structural Reform in the Rural Economy of the USSR," in Stuart, Robert C., ed, The Soviet Rural Economy, p. 260.

17.Hedlund, Stefan, Crisis in Soviet Agriculture (New York: St. Martins Press, 1984), p.106.

18.Chandler, Clark "The Effects of the Private Sector on the Labor Behavior of Soviet Collective Farmers," in Stuart, Robert C., The Soviet Rural Economy (Totowa, New Jersey: Rowman & Allanheld, 1983) pp. 223-234.

19.Wang, James C.F., Contemporary Chinese Politics: An Introduction, 1st ed. (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1980), p. 201.

20.Dernberger, Robert F., "Agriculture in Communist Development Strategy" in Barker et al, eds., The Chinese Agricultural Economy, p 70 mentions that state plans included "hectarage plans (by crop)." Also on page 71 he notes "...the state set quotas for hectarage to be planted by crop. Cropping quotas were reported to cover more than three-fourths of China's cultivated area." I have not found however any mention of hectarage quotas

in the Soviet Union. At times there have been campaigns such as Khrushchev's corn program, but most Soviet quotas seem to be production targets.

21. These 5 types were obtained from a visit to an agricultural commune outside the Beijing area in November 1985. Kueh, Yak-Yeow, "China's New Agricultural Program: Major Economic Consequences, 1979-1983," Journal of Comparative Economics, December 1984 8(4), pp. 357-375 also expands on three types of "Responsibility Systems."

22. Lardy, Nicholas R., "Agricultural Reform in China", A background paper prepared for the World Development Report 1986, October 1985, p. 13.

23. Lardy, October 1985, p. 23.

24. Neuberger, Egon, "Classifying Economic Systems" in Bornstein, Morris, ed., Comparative Economic Systems: Models and Cases, p. 25.

25. Clark, M. Gardner, "Soviet Agricultural Policy" in Shaffer, Harry G., ed., Soviet Agriculture An Assessment of its Contributions to Economic Development, p.27.

26. Originally there were limits on the markets very much like the limits currently on the Soviet Agricultural Markets (Lardy, October 1985, p.7). However, in my visit to a free market in Beijing in fall 1985, I was told that vegetables were shipped up from Southern China in the spring and of the existence of middlemen serving to link rural farmers with the city markets. Lardy (pp 8-9) also notes the substantial increase in interregional grain flows.

27. Hedlund, 1984, p. 106.

28. Unger, Jonathan, "Remuneration, Ideology, and Personal Interests in a Chinese Village, 1960-1980," in Parish, William L., ed., Chinese Rural Development: The Great Transformation, (Armonk, NY: M.E. Sharpe, 1985), p.117. Unger talks about the adoption of the Dazhai system and why it didn't work in a village in Southern Guangdong province. There are also several other articles dealing the Dazhai system.

29. Gregory, Paul R., and Stuart, Robert C., Comparative Economic Systems, 2nd edition (Boston, MA: Houghton Mifflin Company, 1985), p. 33.

30. Gregory and Stuart, 1985, p.32.

31.This is an important issue to note. Because of these limiting and varying factors, changes in output may not be related to the economic system. It should also be noted that both China and the Soviet Union have tried to mitigate the weather factor.

32.Clark, M. Gardener, "Soviet Agricultural Policy" in Soviet Agriculture An Assessment of its Contributions to Economic Development, p.6.

33.Clark, M. Gardner, p.3.

34.Murphey, Rhoads, "Natural Resources and Factor Endowments," in The Chinese Agricultural Economy, p.61.

35.Schoonover, David M., "Soviet Agricultural Policies," Joint Economic Committee, Soviet Economy in a Time of Change (Washington, D.C.: Government Printing Office, 1978). On page 103, Schoonover gives the increases for 1966-70. Gross agricultural output increases 21% and grain increases 29%. On page 107, he notes that gross agricultural output increased by 13% in the 1970-75 period.

36.Shaffer, Harry G., Preface to Soviet Agriculture An Assessment of its Contributions to Economic Development, p. vi.

37.Calculated from Statistical Yearbook of China 1983, (Hong Kong: Economic Information and Agency, 1983), p. 149.

38.Lardy, Nicholas R., "Food Consumption in the People's Republic of China," in The Chinese Agricultural Economy, pp. 147-162.

39.Lardy, Background paper, 1985, pp.15-16.

40.Following the change to the Responsibility System, investment in machinery dropped, implying that the farmers found tractors and harvesters to be unnecessary. Fertilizer usage, however, continues to be very high.

41.Statistical Yearbook of China 1983, p.150.

42.Wong, Christine Pui Wah, "Rural Industrialization in China," in The Chinese Agricultural Economy, table 9.1, p.138.

43.Kueh, Yak-Yeow, "China's New Agricultural Program: Major Economic Consequences, 1979-1983," Journal of Comparative Economics, 8(4), December 1984, pp. 357-375, p. 365. Kueh states that these new industries have replaced the traditional five. However, this is apparently a bit exaggerated.

44.Kueh, Yak-Yeow, 1984, p. 363.

45. Gregory and Stuart, 1985, p 35.

46. Litvin, Valentin, "Agro-Industrial Complexes: Recent Structural Reform in the Rural Economy of the USSR," p. 263.

47. Lardy, 1985, p. 23.

48. Lardy, 1985, p. 23. It should also be noted that new cotton varieties seem to have contributed to production.

49. Estimated based upon improvements during 1960's and 1970's by Schroeder, Gertrude E., "Rural Living Standards in the Soviet Union," in The Soviet Rural Economy, p. 254.

50. All income figures are from Statistical Yearbook of China 1983, pp. 492-503.

51. Statistical Yearbook of China 1983, p. 503.

52. Gregory and Stuart, 1985, p. 39.

53. These shortages are beyond the scope of this particular paper and the reader should seek out either of the following: Kornai, J., "Resource-Constrained versus Demand-Constrained systems," Econometrica, 47(4), July 1979, p. 801, or Kornai, J., Overcentralization in Economic Administration (London: Oxford University Press, 1959).

54. Hedlund, Stefan, 1984, p. 135.

55. Baker, Randolph; Sisler, Daniel G.; and Rose, Beth; "Prospects for Growth in Grain Production;" in The Chinese Agricultural Economy; p.173.

56. Tang, 1984, p. 175.

57. Of the Chinese farm labor population, some have estimated 70% of it is surplus labor. The Chinese agree some extent and wish to decrease their rural population percentage from 80% to 30% of the national population. Statement of CIA staff members in a Question and Answer session in Allocations of Resources in the Soviet Union and China, Hearings before Subcommittee on International Trade, Finance, and Security Economics of Joint Economic Committee, Congress of the U.S., Part 10, Executive Sessions, November 21, 1984 and January 15, 1985, p. 35.

58. Lardy, 1985, p. 21.

59. Johnson, Bruce F., and Mellor, John W., "The role of Agriculture in Economic Development," American Economic Review, 51 (4), September 1961, pp. 569-593, pp. 571-572.

60.Schoonover, David M., "Soviet Agricultural Policies," Joint Economic Committee, Soviet Economy in a Time of Change (Washington, D.C.: Government Printing Office, 1978), p.105

61.Hedlund, Stefan, 1984, p. 89.

62.Tang, Anthony M., 1984, pp 45-60. Tang develops a model to determine whether agriculture constrains industrialization. In the case of the USSR in the 1930's, agriculture wasn't a constraint. China, however, in the 1950's was constrained by agriculture.