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EXCESS CAPACITY: THE EVIL OF MODERN AGRICULTURAL POLICY

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All developed market economies have had governmental agricultural policies that have created excess capacity. The past tense could very well have been the present tense if it weren't for New Zealand, which is now following policies that is resulting in a significant shrinking of its agriculture, perhaps to a capacity level below what would exist in a rational world with free trade in agricultural outputs and inputs. And even though Australia is not without interventions that increase returns to producers of wheat and dairy products, for example, its producer returns are generally below what they would be in a free trade world.

But the rest of the developed market economies--the whole of Western Europe, North America and Japan--have policies that create excess agricultural capacity. This excess capacity has been accommodated by trade interventions or by efforts to restrict production below the level called for by the economic incentives provided to farmers.

What do I mean by excess capacity? It is perhaps easier to define what I mean by reference to excess resources. Excess resources are the resources greater than could earn a return in agriculture comparable to what similar resources earn in the rest of the economy if the prices received and

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paid by farmers were those that would prevail in a free trade regime in the world. Resources used in agriculture are assumed to be fully employed, though not necessarily in agriculture. Some resources, especially labor, may find their best and most profitable use by combining work in agriculture and some other activity.

The excess resources, of course, have the capacity to create excess supply. This capacity may or may not be realized in full. In the EC generally and in the U.S. dairy industry until quite recently the excess resources were induced to produce an excess supply. For several crop products the U.S. has engaged in supply management through limiting the quantity of one input--land--that could be devoted to production. In recent years the EC has utilized output quotas for dairy and sugar to reduce excess supply.

It is worth stopping for a moment to make clear the difference between excess resources and excess supply. Excess supply can be eliminated by a government program that results in an output that can be sold at the prevailing prices or, if one wishes to use the same approach as used in defining excess resources, at the prices that would prevail in a free trade world. But what has to be emphasized is that eliminating excess supply by output quotas or input limitations does not result in the elimination of excess capacity. The capacity to produce is not reduced by such governmental programs. Once the restraints, whether an output quota or an input limitation, is removed and if the same price incentives are maintained, the excess resources are transformed into excess supply.

Two implications may be noted. One is that an input limitation, such as used in the U.S. supply management programs, may actually result in adding to the excess resources. This occurs because when land use is limited the demand for other resources that are close substitutes for land increase.

These include short run responses such as added fertilizer, pesticide and herbicide imports, which presumably would be withdrawn when the land input is no longer rationed, but probably not instantaneously. The response also includes some long-lived investments, such as drainage and irrigation, that add to productive capacity in the long run. There are some offsetting reductions in resource demand due to limiting the land input. Inputs such as labor that have a low elasticity of substitution with land will be reduced when the land input is reduced. Quite possibly the same may be true of machinery, but perhaps not. When the land input is artificially reduced, the value of timeliness of field operations may increase and this may induce farmers to maintain approximately the same stock of machinery even for the reduced area.

The other implication refers to the longer run effects of a program such as the dairy herd buyout. In the short run, it seems to be effective in reducing both excess resources and excess supply. But unless there are decreasing returns to scale of farms in milk production, it is reasonable to assume that the reduction both in excess resources and excess supply will be temporary. Dairy cows can be replaced rather quickly when the forced reduction in numbers is less than 10 percent. And existing farmers can bring together the other resources that were either temporarily or permanently withdrawn from dairy production as a consequence of the operators' five year commitment to stay out of dairy production made by the farmers who participated in the dairy herd buyout. Thus the effects of such an effort on either excess resources or supply will be short-lived. It has merit only if sufficient adjustment is made in price incentives to prevent the resources that were withdrawn from being replaced.

Limiting Excess Supply with Excess Resources

When does it make economic sense to limit excess supply when excess resources exist? In my opinion, it may do so only when the current market situation is a temporarily depressed one. In other words, if output prices are now low and there is near certainty that prices will soon return to a higher and more normal level, a temporary effort to limit excess supply may be both politically and economically acceptable. Such effort to limit current excess supply may be an acceptable alternative when past policy errors have resulted in the creation of enormous levels of stocks of both storable products, including some that are only storable at reasonable cost for a limited period of time, such as butter. These two circumstances are related, of course. Excess supply may be transformed into stocks rather than sold into the market and further depress current prices. After any expectation that current prices are about to recover to acceptable levels and stocks have grown to unacceptable levels, then efforts to limit supply even in the face of continued excess resources may be an acceptable alternative to provide for time to achieve resource adjustment.

Efforts to reduce excess supply while doing nothing to achieve resource adjustment have no historical precedent to support their effectiveness in improving the long run viability of agriculture. After all, the major piece of U.S. farm legislation that has been the intellectual bases for all subsequent legislation over more than a half century was called the Agricultural Adjustment Act of 1933 and it was designed to deal with the emergency conditions created jointly by the Great Depression of the 1930s and large stock of farm commodities. Similarly the PIK program in 1983 was to deal with an emergency situation caused by several factors, including a slowdown in demand growth in international markets and a loss in U.S. market

share culminating in large stocks owned by the CCC. But the solution to that emergency turned out to be shortlived in its effects--prices improved temporarily but then continued at low and declining levels and by 1985 stocks were as large as at the beginning of 1983.

Clear evidence that the price and income policies of North America, Western Europe and Japan that have had some limited effect in reducing excess supplies but have not eliminated excess resources are the high governmental costs in all three areas. The Japanese are able to equate supply and demand for rice, after a fashion, with high producer prices, and subsidized consumer prices and large payments for diversion of land. The EC has almost eliminated the excess supply of sugar, but given the high producer prices for production under the A and B quotas no one can reasonably claim that the excess resources have been eliminated.

Even if the United States were to eliminate excess supply of grains and cotton in 1988 or 1989, it would still be saddled with annual governmental costs of \$20-\$25 billion and annual excess consumer costs of perhaps \$5 billion.

The annual taxpayer and consumer costs incurred in the industrial economies are a rough approximation of what it costs to maintain excess resources in agriculture. For the early 1980s (1980-82) Tyers and Anderson (1987, p. 49) estimate that in terms of 1985 US\$ the combined consumer and taxpayer costs were about \$60 billion in the EC, \$30 billion in Japan and \$20 billion in the United States. Levels of protection were much lower in 1980-82 than today. Even so, these costs were large compared to net farm operator incomes in the early 1980s. Rough estimates of net farm operator income for 1980-82 averaged \$40 billion in the EC-10. For the U.S. the average was \$22 billion, for Japan, \$20. These figures should be adjusted

upward by about 10 percent to convert into 1985 US\$. Thus the cost of retaining excess resources in agriculture was equal to or greater than net farm operator income in the three comparisons.

One reason for the high cost of transferring income to farmers under the circumstances that prevail in Western Europe, Japan and the United States is that farmer supplied inputs have now become a minority of the inputs used in agriculture production. A large part of the transfer--the cost of excess resources in agriculture--goes to pull resources from the nonfarm economy into agriculture. While directly comparable data are not available, the share of intermediate consumption--basically current inputs of nonfarm origin--as defined by OECD were the following approximate percentages of the value of farm production in the early 1980s (in percent):

The EC-10	50
Japan	42
U.S.	47

Consequently only a part of the costs imposed upon consumers and taxpayers by the farm price and income policies of the industrial economies go to the farmer-supplied inputs of labor, management and land. The earlier comparison of the transfer costs and net farm operator incomes exaggerate the proportion of the transfers retained in agriculture. The reason is that in each of the areas there are major components of agriculture that receive little or no protection under existing policies. This is the case in the United States for all livestock production, except dairy, and for a considerable number of crops other than grain and cotton. In the EC many livestock farmers also receive little benefit from the CAP and the same is true for certain fruit and vegetable producers in Japan.

The share of intermediate consumption in total farm output fails to reflect the full significance of nonfarm inputs as sources of output expansion and claimants upon the income produced in agriculture. In the United States the net returns to farm land, owned capital, all labor and management was approximately a quarter of farm output even if one subtracts all expenditures upon livestock and feed from the measure of gross output. Similar calculations for four EC members (Denmark, Germany, United Kingdom and France) indicate that the returns to resources enumerated above as a percentage of farm output range from 18 percent in Denmark to 36 percent in France. Consequently, if all inputs of nonfarm origin are included--capital items as well as current inputs--such inputs account for between 65 and 80 percent of total inputs used in agricultural production. Over a period of a decade, the elasticity of supply of these nonfarm inputs approach infinity.

As John Floyd showed over two decades ago in an article sadly neglected by both policy makers and economists, if the elasticity of supply of purchased inputs approaches infinity and if such inputs account for a large share of total inputs, the long run elasticity of supply of farm output will exceed unity even if the elasticity of substitution between farm and nonfarm supplied inputs is quite low and if the elasticity of supply of farm supplied inputs (land, labor and management) is as low as 0.1 or 0.2. Assuming an elasticity of substitution as low as 0.5, purchased inputs at 65 percent of total inputs and an elasticity of supply of farm supplied inputs of 0.2, the long run elasticity of supply of farm output would be 1.5, several times the 0.3 assumed by Andy Stoeckel in the analysis referred to ^{later} earlier.¹ Even if you reduce the elasticity of substitution to 0.2 and

¹The formula for this result, which is implicit in the article by Floyd, is $e = \frac{(1 - \sigma_c)(\sigma_c + \beta_d)}{\sigma_c}$ as the elasticity of supply of c (purchased inputs) approaches infinity. σ_c is the elasticity of substitution between

$$(\sigma_c \sigma_c + \beta_d) / (1 - \sigma_c)$$

assume that the elasticity of supply of farm supplied inputs is 0.1, the long run elasticity of output supply is in excess of 0.5.

How Many Excess Resources?

Few efforts have been made to measure the quantity of excess resources in agriculture. There were some attempts made for the U.S. during the late 1960s and early 1970s. The measures were based primarily upon the amount of land diverted, with differences in the estimates depending upon the evaluation of the probable product of the diverted land. Estimates of excess productive capacity included one made by Tweeten Quance, Tyner and Tweeten and another by Mayer, Heady and Madsen.

At the time I argued that these estimates were too large, primarily because much of the diverted land was unlikely to return to crop cultivation even if the supply management programs were ended (Johnson 1974). In other words, much of the land that was diverted from 1970-1972 was only useful for farming the farm programs and not for growing corn, wheat or cotton. In 1972, for example, the amount of land diverted under the wheat, feed grains and cotton programs was 59 million acres. Between 1972 and 1974, when there were no acreage limitations, the acreage planted to wheat, feed grain, cotton and soybeans was 26 million acres more than in 1972. The returned average was just 44 percent of what the farm programs had made diversion payments on two years earlier. True, two years later the increase in planted area over 1972 was equal to two thirds of the area diverted in 1972. But there is considerable evidence that a significant part of the increase in planted area by 1976, and even further increases later, was due to de-

purchased and farm supplied inputs, β_d is the elasticity of supply of farm supplied inputs and K_c is the share of purchased inputs in total inputs.

velopment of new cropland rather than the return of all the diverted land.

I know of only one estimate of excess productive capacity for the U.S. for the 1980s and that is reported upon elsewhere in this session.

My view that there were few excess resources in U.S. agriculture in the early 1970s has been contested on the ground that the government expenditures on farm programs, measured in constant prices, were as large in 1970-72 as during the early 1960s. In terms of 1982 \$, average annual government expenditures for 1970-72 were \$9.6 billion compared to \$10.3 billion in 1962-65. However, during the early 1970s feed grain stocks were being reduced and the dollar was overvalued, probably by 10 percent. The overvaluation of the dollar did not just happen in the early 1970s, but had existed for a number of years. This overvaluation clearly depressed gross farm income and would have resulted in fewer resources being engaged in agriculture than would have been true in a free trade world. The government farm programs, with the deficiency payments and price supports above market clearing levels, held more resources in agriculture than could have been sustained at market clearing prices, given the overvaluation of the dollar. Thus during these early 1970s there were excess supplies at the then prevailing prices, but there were relatively few excess resources.

Another approach, and I would argue a preferable one, to the estimate of excess resources in agriculture has been utilized by Andy Stoeckel and associates for the EC-10 (Brechling). A general equilibrium model was estimated. Two critical parameters were a long run elasticity of agricultural supply of 0.3 and price enhancement by the CAP of 50 percent from the mid-1970s to the early 1980s. On the basis of these and other assumptions, it was estimated that EC agricultural output had been increased 18 percent by the CAP. According to this estimate, approximately half the increase in

EC agricultural output during the past two decades has been generated by the CAP. Or if applied specifically to grain, it means that in 1980 the EC would have been a net importer of perhaps 20 million tons of grain, approximately its position 15 years earlier.

One can quarrel with some of the assumptions. Perhaps the long run aggregate supply elasticity of 0.3 is too high, but if you reduce it by a third you still get an output increase of 12 percent. On the other hand, the price enhancement offered by the CAP has probably average more than 50 percent over the past two decades. While output may have been increased by 18 percent by CAP compared to what it would have been under free trade, this estimate underestimates the impact of the CAP on world trade in farm products since an important impact of the CAP prices has been to reduce consumption in the EC. Should the 18 percent output increase be adjusted downward to account for the increased consumption that would occur in the EC under free trade? Actually only to a limited degree since the increase in EC consumption would then be a factor affecting world demand and prices and thus the equilibrium level of agricultural output in the EC consumption would then be a factor affecting world demand and prices and thus the equilibrium level of agricultural output in the EC. If world market prices increased by 15 percent as estimated by Tyers and Anderson (1987) for 1980-82, the long run effect would be to increase EC agricultural output by about 4.5 percent. Thus if all industrial market economies liberalized their agricultural trade, EC excess agricultural resources might be put at about 13 to 14 percent of the 1980-82 level of resource use.

There are substantial excess resources in Japanese agriculture. The combination of tax treatment of agricultural land and the restrictions imposed upon the sale and leasing of land make it difficult to estimate how

many excess resources are in agriculture if there were both free trade and freedom to buy, sell and transfer land without governmental intervention. It seems idle to speculate about the degree of excess resources now in agriculture as it is highly probable that trade liberalization would be followed by domestic liberalization in the use of agricultural resources. With the rationalization of Japanese agriculture output would be reduced by far less than the relative quantity of resources removed from agriculture due to the significant improvements in productivity. While fortunately or not, the excess resources in EC agriculture are generally efficiently used in a technological sense, such is not the case in Japan.

Supply management that resolved an excess supply situation could be an appropriate second best policy if it were correctly assumed that the causes of the disequilibrium between supply and demand at the price objective (target or threshold price) were temporary in nature or that there was some reasonable expectation that conditions would change and result in significantly higher prices. Is there any reasonable chance that the present concern about excess resources in agriculture in the United States is a misplaced concern?

I was surprised recently by a telephone call that indicated that some persons had convinced themselves that a successful GATT negotiation would make it unnecessary to concern ourselves about the problem of excess resources. The call was made in search of research that would provide information about the effects of a Harkin-type production control with high domestic prices and low export prices. When I noted that such a program would in the long run only increase land prices, I was told that this was agreed but the program was considered only for four or five years until the GATT negotiations could be concluded and there was a general improvement in

demand in international markets. If valid, some would consider this an attractive scenario. It would transfer most of the costs of farm subsidies from taxpayers to consumers and promise a market-oriented agriculture in due course.

It is true that current international prices of grains and soybeans are exceedingly low in real terms. Real grain prices are below those of the Great Depression and significantly below the trend line for the past six decades. In real terms, U.S. export prices of wheat in early 1987 was about 20 percent of \$10 per ton (1967 \$) below the long term trend (1925-29 to 1983-85) and corn was almost 40 percent below the trend value. The low level of prices is due to some considerable extent to the U.S. effort to dispose of stocks accumulated as the result of prior high price supports and high target prices. If and when the stocks return to more normal levels, market prices will increase but there is little reason to expect the recovery to raise grain prices above their long term trend values.

True, in addition to the depressing effect of U.S. disposal operations, current international prices are depressed as a result of slow world economic growth and the import restraints imposed by heavily indebted developing countries. Thus sooner or later international prices will strengthen relative to recent levels but are most unlikely to rise above trend levels. This will be the case even in GATT negotiations are successful, if Tyers and Anderson's (1987) estimate of the effect of trade liberalization by all industrial economies are accepted as reasonable, as I believe they are. For food products they project that by the early 1990s international prices with continuation of farm and trade policies as of 1987 would be about 60 percent of the 1980-82 levels in constant prices. With

full liberalization international market prices would increase by 30 percent. However, the largest increases were projected for dairy products (95 percent) and ruminant meat (43 percent). Even a doubling of dairy product prices would not bring them to the U.S. levels. Projected price increases for grain are 25 percent for wheat and 18 percent for rice but only 3 percent for coarse grains. I believe the projected increase for coarse or feed grains is too low, yet even if one assumes that feed grain prices would increase by a fifth due to trade liberalization this would still leave these prices well below the 1980-82 international market prices in real terms.

There can be little doubt that international market prices for grains and soybeans will increase from the current very low levels over the next few years. How much the prices will recover depends upon the pace of world economic growth, the degree of resolution of LDC debt problems, and the reduction of incentives for the production of agricultural products in the industrial countries. Prices will remain significantly depressed until the ratio of world stocks to consumption for grains return to more normal levels. But since it is always a mistake to believe things are really as good as they seem, it is equally wrong to assume that things are really as bad as they seem. Thus tomorrow will be brighter than today. But I see no foundation for the assumption that the price improvement that can be realistically anticipated will be great enough to employ the resources that are now engaged in U.S. agriculture at returns comparable to those available in the rest of the economy. Thus resources must exit from agriculture if U.S. agriculture is to receive its returns from the prices that prevail in the international market and not the U.S. Treasury or by forcing U.S. consumers to pay in excess of world market prices for what they eat or wear.

Excess Resources have Other Origins

While agricultural price and income policies bear much of the blame for the existence of excess resources in industrial country agricultures, there are other sources. Most of the excess resources now in U.S. agriculture were due to national and individual decisions made in the 1970s.

The substantial growth of investment in agriculture resulted from the macroeconomic policies that resulted in negative real interest rates for several years, federal income tax policies that made agriculture into an enormous tax shelter, and inaccurate expectations on the part of many farmers that the good times would continue to roll. These expectations were fueled by misleading statements emanating from Independence Avenue in Washington, culminated by a national disgrace, The Global 2000 Report to the President. The erroneous expectations infested the Congress and the Reagan Administration as evidenced by the 1981 Farm Bill, which seemed to be based on the assumption that world demand for food was going to outstrip demand for years to come.

It wasn't only in the United States that unrealistic expectations were held by both farmers and government officials. As late as 1983 Japanese officials continued to emphasize that world food shortages were highly likely and have not as yet retracted their erroneous projections, so far as I know (Johnson). In its 1981 Guidelines for European Agriculture the EC Commission justified high and stable prices on the grounds that European consumers could not be assured that they "could be supplied for long at low and stable prices if Community supply, because of reduction in production, would depend to a greater degree on imports" (Johnson).

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