THE DISTRIBUTIONAL CONSEQUENCES OF RECENT INFLATION

by

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Income redistribution is an inevitable by-product of inflation, simply because all prices do not move upward at the same rate. The most recent period of accelerated inflation in the United States, that is the period beginning in 1972 and continuing up to the present time, has been characterized by extremely diverse changes in incomes within agriculture because the prices for different commodities have peaked at different times and have risen by widely varying amounts. Income redistribution also has occurred because factor price ratios have changed. Appreciation in land values has redistributed income from new entrants to those retiring from agriculture. Debtors clearly have gained relative to creditors. But I do not propose to dwell on these more obvious effects of inflation. Instead, I intend to focus on those aspects of recent inflation that appear to be somewhat unique or different from what we have experienced in the past. I shall begin with an analysis of interregional income transfers resulting from the widely divergent changes in commodity prices that have occurred since 1971. I shall turn next to the effect of recent inflation on income inequality within agriculture, that is on what may be referred to as the "Pareto" distribution of income. Third, I will examine the possible long-term consequences of recent changes in relative factor prices; and finally, I will comment briefly on the distribution effects of changes in food prices.

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Regional Effects

Few generalizations can be made about the distributional consequences of recent inflation because of the diversity of price movements. Gains and losses among farmers have been associated with their product mix, when they sold or priced their output, their dependence on purchased feed, and when they began farming. Some regions clearly have gained much more than others and this in turn has influenced relative rates of inflation in land values.

It is difficult to sort out the effects of general inflation from other factors which have contributed to the erratic behavior of farm prices since 1971. There is no simple way in which this diversity in price behavior can be expressed, but one can highlight the differences by noting the range over which major commodity prices have moved since 1970-71 and in what year prices peaked. The peak season average price for wheat (which occurred in 1974) was more than 3 times the average price prevailing in 1970-71 (table 1); at the other extreme, the peak increase in the price of eggs over the same period was only 66 per cent. These figures do not take into account the changes in prices that have occurred since 1978.

The diversity in price behavior, especially between grains and livestock products, is striking. Grain prices peaked earlier and at much higher levels relative to 1970-71 than livestock prices. This had the effect of redistributing income within agriculture. Grain producers gained relative to grain feeders in the mid 1970s. The aggregate net income of farmers in North Dakota, to take the most extreme case, more than quadrupled between the early and mid 1970s. But in states that rely on purchased feed, such as New York, the aggregate net income of farmers actually declined during this period.

Table 1. Peak Prices in the Period 1972 to 1978 and the Ratio of Peak Prices to Season or Annual Average Prices in 1970-71

Commodity	Ratio of Peak Price to 1970-71 Average*	Peak Year
Wheat	3.06	1974
Corn	2.52	1974
Cotton	2.51	1976
Hogs	2.32	1978
Soybeans	2.26	1978
Milk	1.83	1978
Beef	1.73	1978
Eggs	1.66	1976

* Based on season average or annual average prices, not individual months.

Source: Computed from U.S.D.A., Agricultural Prices, Annual Summary, 1975 and 1978.

Maximum changes in aggregate net farm income for each state were calculated for the period 1971 to 1978 in order to obtain some indication of relative gains which farmers in different areas have experienced during the recent period of accelerated inflation. Maximum gains calculated as a per cent of aggregate net farm income in 1970-71 ranged from less than 50 per cent in most of the Northeastern States (with the exception of Maine) to over 200 per cent in North and South Dakota, Washington, Oregon, Arizona and Illinois.

Wide differences also exist among states in the rate at which land prices have appreciated. As one would expect, states in which incomes have gone up the most also tend to have experienced larger increases in land prices. Based on a superficial examination of the state data, it appeared that a first difference analysis relating maximum changes in net farm income to changes in land values would produce interesting results. But the R^2 value turned out to be relatively low, thus indicating that only a small part of interstate differences in the behavior of land prices since 1971 can be attributed to relative rates of change in farm incomes. In a few regions, there was consistency among states in the relationship between changes in income and land prices, but not in others.

States which exhibited reasonably uniform behavior were grouped together and the percentage changes in both land values and net farm income were then calculated. Regions were omitted in which there was considerable variation among states in the behavior of land prices and incomes. In the West, for example, land values have gone up much less in California than they have in Oregon, Washington or Idaho. Substantial

differences also can be observed within the Mountain states and among those that make up the "Old Cotton South".

Percentage increases in land values from 1971 to 1978 were approximately equal to the maximum increase in net farm income for the group of states chosen to represent the Great Plains (table 2). A similar relationship prevailed in the Southeastern states, but in the Corn Belt land prices rose almost 50 per cent more than the maximum increase in farm incomes. The divergence between the maximum increase in land values and net farm income was even greater in the Northeast. Land values more than doubled in that area between 1971 and 1978, but this occurred despite a very modest increase in net farm income. Nonfarm demand for land obviously has played an important role in accelerating inflation in land prices since 1971, and perhaps more so in the Northeast than in the Mid-west or the Great Plains.

Income Inequality

One can be reasonably confident in concluding that recent inflation has contributed to a greater degree of income inequality among regions and types of farms, but it is less certain what effect it has had on the incomes of those operating large as compared to small-scale or medium-sized farms. Inflation has made our statistics relating to farm sizes (which are based mainly on gross sales categories) almost meaningless (Stanton). Inflation also has added to the difficulties one encounters in attempting to compare the distribution of income over time. We know that gains in income are correlated with gross farms sales, but we do not know precisely how much of the recent increase in net income on large farms is attributable to inflation and how much to other factors. Again, differences in product mix affect the distribution. Large farms producing wheat, corn and soybeans

Table 2. Maximum Changes in New Farm Income and Increases in Land Values Between 1971 and 1978 for Selected Groups of States

Region	Increase in land prices, 1971-78	Maximum increase in net farm income*	Ratio: land price/income
	(per cent)	(per cent)	
Corn Belt	241	166	1.45
Great Plains	160	164	.98
Southeast	112	110	1.02
Northeast**	133	38	3.50

* Based on the per cent increase in the aggregate net farm income of each state, adjusted for inventory changes, from 1970-71 to the peak year between 1972 and 1977.

** Excluding Maine.

Source: Calculated from U.S.D.A., State Farm Income Statistics, Supplement to Statistical Bulletin No. 609, September 1978 and Agricultural Statistics.

probably increased their share of total income during the mid 1970s, but not all large farms produce grains. Many of them specialize in the production of commodities whose prices have risen much less than the overall rate of inflation. Over the period from 1971 and 1978, for example, the incomes of cattle ranchers, feed lot operators, poultrymen and many of those producing vegetables for processing lagged behind. At the same time, those at the lower end of the income distribution, regardless of their product mix, were receiving more income from off-farm sources. Thus, it is not clear that the "Pareto" distribution of income has, in fact, been altered significantly as a result of recent inflation although it is possible this has occurred.

The most recent period of inflation has been accompanied by exceptionally large seasonal changes in prices. Increased volatility in prices may be attributable in part to more speculative trading on the part of those who have become disenchanted with the stock market and are turning to commodity markets in an attempt to "beat inflation". One of the by-products of increased volatility in prices has been to afford opportunities for exceptional gains to those who have been either very astute or lucky in the time they chose to sell or price their crop. The timing of transactions has become a critical management decision. Optimum timing of wheat sales in 1978-79, for example could have added as much as $2 per bushel to a farmer's return. Soybeans is another crop in which timing of sales has been especially important. The 1979 July futures price, for example, has ranged from around $6 to over $8.50 per bushel.

I have no information which would enable me to determine what types of farmers have been most successful in timing their sales, but my guess is that the larger farmers who are well financed and have relatively modest debts have been more successful in exploiting seasonal price changes than

have small farmers and new entrants. The former have access to more information and can afford to hold their crop in anticipation of a rise in prices later in the season or even in subsequent years. Thus, my hypothesis is that recent inflation has widened income differentials among farmers producing similar products (mainly grains) and that these differences are associated with management skills related to the timing of sales or transactions on the futures markets.

Relative Changes in Factor Prices

The distribution effects of changes in relative factor prices or costs are even more difficult to identify than those associated with changes in product prices. One of the obvious differences between the most recent period of inflation and those experienced earlier is the relative rise in the price of energy and petro-chemicals, including nitrogen fertilizer. Farmers which use abnormally large amounts of energy, such as those who depend on deep wells for irrigation, obviously will be disadvantaged in the future relative to those who rely on natural rainfall or gravity irrigation. Those farming soils with low inherent productivity and no livestock also may find their relative advantage declining as a result of the rise in the cost of nutrients. But thus far, these changes in the cost of energy and petroleum-based products have had little impact on the regional distribution of income.

Since my interest is in attempting to identify what is unique about recent inflation, I chose to look at relative changes that occurred during this period with those that took place during earlier periods of inflation. Two earlier periods were selected for comparative purposes: the first was the period from 1940 to 1949 during which the rate of inflation was more

nearly comparable to what we have experienced recently; the second was from 1960 to 1969 when inflation was proceeding at a much slower rate.

Three price series or index numbers were selected to represent changes in the prices of the major factors or inputs in agriculture (land, farm wage rates and an index of tractor and farm machinery prices). The percentage change in price that occurred in each of the three periods of inflation was then calculated. These percentage changes in factor prices were divided by the per cent change in industrial wholesale prices in order to form a ratio which shows the relative change in factor prices which took place during each period of inflation. The index of industrial wholesale prices was chosen as the denominator or deflator because it is broadly based and is a reasonable indicator of the underlying rate of inflation for the economy as a whole. The percentage increase in farm prices during each period was also divided by the percentage change in industrial wholesale prices to determine what changes may have occurred in the overall terms of trade of farm products. The results of these calculations are shown in Table 3.

The increase in average farm prices between 1971 and 1978 was about equal to the increase in industrial wholesale prices over the same period. In this respect, the recent period of inflation differs substantially from the 1940s. During the earlier period, farm prices rose much more than industrial prices.

Machinery prices have risen more than industrial prices since 1971, but this should not be considered unusual since it is consistent with what happened in the 1940s and 1960s. In fact machinery prices rose more relative to both industrial and farm prices in the 1960s than have since 1971.

Table 3. Relative Price Changes in Three Periods of Inflation

Period of inflation	Per cent change in industrial wholesale prices	Ratio of change in each index to industrial wholesale prices			
		All farm products	Farm land	Farm wage rates	Tractors & farm machinery
1940-49	+ 71	2.1	1.6	3.3	1.1
1960-69	+ 11	1.1	6.0	5.5	3.0
1971-78	+ 84	1.0	1.8	1.0	1.3

Source: Calculated from data in Agricultural Statistics, 1952, 1967 and 1978 and the Economic Report of the President, January 1979.

Average farm wage rates increased no more rapidly than industrial prices between 1971 and 1978. In the 1960s, the increase in farm wage rates was 5.5 times the percentage increase in industrial prices. If recent trends persist, there will be less incentive to substitute capital for labor over the next few years than there was in the 1960s.

As everyone is aware, land values have gone up relative to both farm and wholesale prices. But this is not a new phenomenon. Land prices actually rose more relative to farm product prices in the 1960s than they did between 1971 and 1978.

An increase in land prices relative to the prices of farm products has important long-run distributional consequences. It changes the distribution of returns among factors, increasing the proportion which flows to land and decreasing the proportion which goes to reward labor and management. It also distorts decision-making, rewarding those who are successful in land speculation relative to those who are simply good farm managers. Returns from appreciation in land have exceeded returns from farming in recent years as Breimyer and others have pointed out.

Inflation in land values also may serve to widen income differentials among farms. Established farmers and those already more financially secure in the community can generally outbid new entrants for whatever land becomes available, thus tending to reinforce existing income inequalities.

If inflation persists, an increasing proportion of the land is likely to be owned by those who have no interest in actually farming the land. Since land is looked upon as a hedge against inflation, few will want to sell it. Wherever possible, it will be passed on within the family. But many of those who inherit land will elect to rent it rather than to farm it. This will lead to further separation of land ownership from farm operation.

Separating or divorcing land management from farm management, while inconsistent with the Jeffersonian ideal, need not be disastrous for agriculture provided those who own the land are content with a modest current return on their investment and take a long-term interest in preserving the land. Many farms are now being rented for less than a farmer would have to pay if he owned the land. Furthermore, by divorcing ownership from farm management, the real estate tax burden, which has become of increasing concern to farmers as land values have risen, would be shifted to those who want to speculate in land.

It is not too soon for agricultural economists to begin thinking more seriously about alternative institutional arrangements that would encourage good land management and make it possible for those with limited capital to enter farming. This is precisely what the British tried to do in the late 19th century with their tenure reform laws. The aim was to protect the rights of tenants, to reward them for any improvements they made on the land, and to encourage practices that would maintain the long-term productivity of the land. In the past we have tried to solve the problem of entry into agriculture by liberalizing credit. This has had the effect of reinforcing inflation in land prices. We should now consider the possibility of creating new institutions that will enable those with limited capital to become farmers and let those who have the capital and want to speculate in land to pay the taxes and carry the costs of land ownership.

Distributional Effects of Inflation in Food Prices

In contrast to their behavior in the 1960s, food prices have risen more than other items in the Consumer Price Index since 1971. Gains from higher

food prices have been shared by farmers and middlemen. Since food expenditures absorb a higher percentage of the income of families at the lower end of the income scale than those at the upper end, this transfer of income through higher food prices is equivalent to a regressive sales tax. Furthermore, since much of the meat, fruits and vegetables purchased by low income families is produced on farms with sales in excess of $100,000 per year, one might argue that the transfer of income associated with recent inflation in food prices has been socially undesirable.

The poor obviously have been compelled to pay more for food, but the incomes of the "poorest of the poor", or at least those participating in the Food Stamp program and those receiving Social Security benefits, are now indexed to take account of inflation. Food stamp benefits are adjusted semi-annually in accordance with changes in the cost of a market basket which includes foods typically consumed by low-income households. Social Security benefits, likewise, are now raised automatically each year and, in fact, have gone up more than the Consumer Price Index since 1971. Thus it is probably fair to conclude that those most adversely affected by rising food prices are families whose incomes are just above the poverty line or those who elect for a variety of reasons not to participate in the Food Stamp program. With increasing indexation, including mandated increases in minimum wages and higher medicaid payments, the social consequences of inflation in food prices are less serious now than they would have been five or 10 years ago.

Conclusions

Few generalizations can legitimately be made about the distributional consequences of recent inflation. Income has been redistributed within and between agriculture and the rest of society, but in ways that can be

described with only slight exaggeration as capricious. Commodity prices have behaved erratically in response to a multitude of exogenous forces, including poor crops in the Soviet Union, drought and a short growing season in the U.S. in 1974, the entry of China into the world market on a much larger scale, a freeze in Florida, too much or too little rain in California, and a poor soybean crop in Brazil. Differences in the timing and magnitude of changes in commodity prices have produced wide fluctuations in farm incomes and unequal benefits among producers. Gains in real income were concentrated chiefly among grain producers in the mid 1970s, but subsequently those selling cotton, citrus and other fruits also benefited. More recently, incomes have been redistributed from consumers to livestock producers, not because of inflation, but mainly because the liquidation phase of the cattle cycle has ended.

Existing inequalities in income within agriculture probably have been reinforced by rising land prices and the ability of farmers with secure financial resources to hold commodities and to take advantage of abnormally large intra as well as inter-seasonal fluctuations in prices. But not all those operating large farms have gained since many produce commodities whose prices during much of the past seven years have gone up less than the overall rate of inflation. This includes producers of eggs, fed beef and a number of vegetables sold for processing. Small-scale and part-time farmers have benefited as much from increasing off-farm income as they have from higher farm prices.

Income also has been redistributed among factors of production and between generations. Most, if not all, of the benefits from rising commodity prices have been capitalized into the value of farm land. This is nothing new, but the effects have been far from uniform among states.

Farm wage rates have risen less than the price of machinery, energy and fertilizer since 1972 which is a marked change from what happened in the 1904s and again in the 1960s. This reversal of past trends has not had much effect as yet in altering factor combinations, but it is likely to do so in the future.

Finally, indexation of transfer payments, mainly Food Stamp and Social Security benefits, has reduced the potential adverse social consequences of rising food prices. This also has made it more difficult to determine precisely who wins and who loses from inflation. Some of the old rules about who benefits from inflation still apply. Debtors and those who bought land some years ago clearly have gained relative to creditors and new entrants into farming. But with more widespread indexation, even of private pension plans, and increasing public subsidies for medical care, housing and possibly home heating for the poor and elderly, the victims of inflation are less obvious.

References

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