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# *Macro Linkages and Agriculture: The United States Experience*

It is a pleasure for me to discuss the macro linkages and agriculture for the case of the United States. The US experience is probably unique in the world, given its position as central banker for the world and its role in international commodity markets. The particular configuration of commodity programmes the United States uses also causes her experience to be of particular significance to other countries.

In discussing this issue I will draw on two earlier pieces of mine. The first is my 1974 article on 'The Exchange Rate and US Agriculture' (Schuh, 1974). The second is a paper I did with David Orden on 'The Macroeconomics of Agriculture and Rural America' (Schuh and Orden, 1988) I have chosen to concentrate on telling a narrative story. Supporting evidence for at least part of the story can be found in the two background pieces.

My paper is divided into two main parts. The first part concentrates on macroeconomic policies and US agriculture. The second part concentrates on the effect of US policies on agriculture in other parts of the world. This second set of issues is probably unique to the United States and is of considerable experience to other countries.

## THE UNITED STATES EXPERIENCE

Trying to understand the effect of macroeconomic policies on agriculture is of fairly recent vintage, although today it constitutes somewhat of a growth industry among agricultural economists. At the time my 1974 article was published, many of my colleagues thought I had lost my mind, and didn't hesitate to tell me so either personally or in print.

Although my original paper was motivated by the apparently episodic events of the early 1970s, considerable effort was devoted to a reinterpretation of the post-World War II development of US agriculture. That story bears repeating here, since it is critical to an understanding of US agricultural policies, the performance of its agricultural sector, and some of the developments in global agriculture.

US agriculture came out of World War II producing at full or near-full production. Although many observers thought at the time that price support

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levels were too high and that too many resources were committed to agriculture for a peace-time economy, production was absorbed for a time by US efforts to help restore war-torn Europe.

The first major monetary disturbance to US agriculture in the post-war period came in 1949 when a number of European countries devalued their currencies relative to the US dollar (Houthakker, 1962). This action was in response to a chronic dollar shortage which prevailed as European economies recovered from the wartime destruction of their economies. This dollar shortage suggests that the dollar was undervalued at that time and thus serving as an export subsidy.

The devaluation of 1949 should have reduced the demand for US agricultural exports, and imposed a severe jolt on US agriculture. History and *ex post* studies (Vanek, 1962, and Houthakker, 1962) have shown that the devaluations of the European currencies were too much and thus caused the US dollar to become overvalued. However, the effect of this overvaluation was masked for a short time by the commodity boom associated with the Korean War. It was only after that war first reached a stalemate and then came to a close that the effect of the overvalued dollar began to have an affect.

In 1952, US agricultural exports dropped significantly, followed by another significant drop in 1953. By 1953, in fact, the acreage devoted to exports was only 50 per cent of what it was in 1951. It is not insignificant that an Agricultural Trade Development and Assistance Act (better know as PL 480) was passed by the US Congress in 1954. This act was a very significant piece of agricultural legislation.

Developments that followed in the 1950s and the 1960s have to be understood in the context of the Bretton Woods fixed exchange rate system established at the end of World War II and the role the United States played in that system. The Bretton Woods Conventions required that nations change their exchange rates only under unusual circumstances. Imbalances in the external accounts were to be eliminated by changes in domestic economic policies rather than by exchange rate realignments.

The United States abided by these conventions even though the evidence, even at the time, was strong that the dollar was overvalued. Policy makers grappled with a chronic deficit in the balance of payments which extended from 1950 to 1971, and with it an associated outflow of gold. The policy measures to deal with this problem were relatively tight monetary policies and a near balanced budget except for periods of economic recession. To offset the effects of the overvalued dollar, the United States in this period made extensive use of food aid, which involved an implicit export subsidy. Towards the end of the period, it also used explicit export subsidies. Thus we had the paradox of the country which most observers believed had the most productive agriculture in the world having to subsidize its exports. But even these measures were not sufficient to bring agriculture into balance at prevailing exchange rates. Eventually, price support levels were permitted to drift downward in real terms. This helped to squeeze labour and other mobile resources out of agriculture, and land retirement programmes were used to take approximately 60 million acres of land out of production. By the end of the 1960s agriculture was approximately in adjustment to the overvalued currency.

An important part of my 1974 article was devoted to an analysis of the effects

of these policies on agricultural development. I summarized these effects in three propositions (p. 2): (1) that an important share of the income problems of US agriculture in the post-World War II period was a result of the persistent overvaluation of the US dollar, which resulted in an *under*valuation of its agricultural resources in relation to their world opportunity costs (in contrast to the usual perception that these resources were *over*valued); (2) that the stress caused by this undervaluation of agricultural resources forced a more rapid rate of technical change than would otherwise have been obtained and that this in turn aggravated what would have in any case been a serious adjustment problem; and (3) that the overvaluation of the dollar resulted in a larger share of the benefits from the technical change in agriculture being channelled to US consumers than would have occurred with an equilibrium exchange rate.

Two additional aspects of policy are worth stressing. First, the agricultural policy response to these problems, which focused on land retirement, made land artificially scarce in a relative sense and thus induced the adoption of land-substituting inputs. Thus it influenced the technological path chosen within agriculture. Second, the tight monetary policies which were pursued to bring the external accounts into balance, given the overvalued dollar, made the adjustment of labour out of agriculture quite difficult. This complicated the overall adjustment problem and caused the relative income problem in agriculture to be chronic and severe.

So much for the story of the 1950s and the 1960s. The next chapter starts in about the mid-1960s and extends to the early part of the 1970s. The Johnson Administration launched the programmes of the Great Society, and the United States became increasingly involved in the Vietnam War. Unfortunately, taxes were not raised to support either endeavour. Increasingly, money was printed to finance these activities and inflation began to pick up in the United States. The US dollar became increasingly overvalued.

The US quarrelled with West Germany and Japan, the two major surplus countries, over whether they should revalue their currencies or whether the United States should devalue the dollar. Finally, in 1971, President Nixon devalued the dollar. When after a period of time this seemed not to have the desired effects, he devalued again in 1973 and announced simultaneously that henceforth the value of the dollar would be determined by foreign exchange markets. Thus came to an end the Bretton Woods fixed exchange rate system, the breakup of which began in the late 1960s.

This change in the exchange rate system, together with the emergence of the huge, well-integrated international capital market in the 1960s and early 1970s, significantly changed the environment for international commodity markets and how they must be understood. Before discussing those issues in the second part of my paper, I want to review briefly the events of the 1970s and early 1980s.

The fall in the value of the dollar in the early 1970s was substantial. When US actions were combined with the revaluation of the currencies of certain US trading partners, the realignment was of the order of 25 per cent in real terms. The result was an agricultural export boom of unprecedented proportions for the United States, a boom which was sustained through to the end of the 1970s.

Unfortunately, this boom was poorly understood at the time. Many attributed it to the entrance of the Soviet Union into international commodity markets, as

if that entrance had nothing to do with the fall in the value of the dollar. Others attributed it to the first decline in global agricultural output after a sustained increase over a period of years. And still others attributed it to an emerging Malthusian crisis in the developing countries due to rapid population growth. Domestically, everybody wanted to take credit for the unusual export performance. Policy makers said it was due to their free market policies which unleashed the US farmer. The exporters said that it was due to their valiant efforts. The farmers said it was due to their hard work and unusual efficiency. And so on. It was only when the bubble collapsed in the 1980s that the value of the dollar surfaced as the cause of all the difficulties of US agriculture. It emerged only because the collapse of US agricultural exports was a fatherless child. Nobody wanted to take credit for it! More on that later, however.

Other aspects of US macroeconomic policies during the 1970s are worth noting. First, the US did an unusually poor job of managing these policies during this decade. Monetary policy was unstable and uncertain. Federal budgets were no longer balanced, or even close to being balanced. We had Watergate and the unplanned change of a President. Inflation, by US standards, burgeoned out of control. And real interest rates turned negative for extended periods of time. The value of the dollar, after its initial fall in the early 1970s, stabilized during the mid-1970s, and then drifted downward again as the 1970s wore on.

The adjustments in agriculture were significant. After a long period of adjustment of labour out of agriculture, there was a reverse flow back to agriculture in response to the early stages of the export boom.[1] Perhaps more importantly, land values were bid up very significantly. This was partly due to the unrealistic expectations for the future created by the general failure to understand what were actually the causal forces at work, including many articles in the popular press about a Malthusian crisis. But the sustained periods of negative real rates of interest and unstable rates of inflation undoubtedly contributed importantly to the boom in the land market.

This brings us up to the end of the decade, 1979, when OPEC engineered another large increase in petroleum prices. With the growing US dependence on imported petroleum, the US dollar began once again to plummet in foreign exchange markets.

Paul Volker, chairman of the US Federal Reserve Board was in Europe at the time. He hurried home to launch what was the third monetary disturbance to affect US agriculture in this post-World War II period. After his return, the Federal Reserve stopped monetizing the debt created by the now chronic deficit in the Federal budget. The result was an unprecedented rise in dollar interest rates. Associated with that rise in interest rates was an unprecedented rise in the value of the dollar as asset owners globally shifted out of assets denominated in other currencies and into assets denominated in US dollars.

The 1980s have witnessed unusual macroeconomic policies in the United States. Tax rates were cut to revitalize the US economy after the sluggish performance of the 1970s. Government expenditures were not cut accordingly, however. The result was a burgeoning Federal deficit. The Federal Reserve stuck to its tight monetary policies, however, and brought about a rapid and significant disinflation of both the US and the global economy. The high interest rates in the United States, brought about by contradictory monetary and fiscal policies, were

made even more significant on the international scene by the fact that the countries of Western Europe and Japan were pursuing contrary policies – conservative fiscal policies and easy monetary policies. The result was a sustained flow of capital into US dollar-denominated assets, and a sustained rise in the value of the dollar, which peaked only in May of 1985.

The shock of this changed configuration of macroeconomic policies on US agriculture was dramatic. The significance of the shock was magnified by the response of the Administration and Congress to the embargo on grain sales to the Soviet Union at the end of 1979. The Administration and Congress outbid themselves in pushing up support levels in 1980. Then when the 1981 farm legislation was passed, support levels were increased again, escalated for future years, and the discretion of the Secretary of Agriculture to reduce them was taken away.

US agriculture was once again hit by a double blow. Not only did its export markets disappear and domestic prices decline in response to the sustained rise in the value of the dollar, but skyrocketing interest rates took the bubble out of the land market. Asset values collapsed, farmers faced financial stress and foreclosure, and incomes collapsed. It is only after the retirement of significant amounts of land, a modest decline in the real value of the dollar, the use of implicit and explicit export subsidies, and now the drought of 1988 that agriculture has begun to recover.

There are a number of lessons to be learned from the US experience. First, there now seems to be little doubt in the minds of serious students of US agriculture that macroeconomic policies have an important effect on the agricultural sector, nor that an important vehicle for that effect is the changes that are brought about in the value of the US dollar. Second, these changes can bring about changes in domestic commodity programmes, as they did in the 1960s and again in the 1970s when domestic agricultural policy was liberalized. But the domestic programmes themselves can also affect the significance of the effects of macroeconomic policies, as they have in the 1980s when rigid support levels helped stimulate production abroad while at the same time limiting adjustment at home. Third, the value of a nation's currency can influence both the rate of technical change and the factor-saving direction it takes. Finally, the value of the currency in foreign exchange markets influences the extent to which the benefits of technical change are shared between consumers and producers.

## THE EFFECT OF US POLICIES ON OTHER COUNTRIES

There are a number of issues that could usefully be discussed in this part of my paper. In the interest of brevity, I have chosen to focus on only three.

The first is the interaction of US commodity programmes and the value of the dollar. This interaction is complicated and important and can perhaps best be illustrated by the experience of the 1980s. When price support levels are rigid and the value of the dollar is rising, the effect is to push the price of US commodities up in terms of the currencies of other countries. This occurs because the United States is a 'large' country in terms of these markets. The impact of such a

development is to provide a stimulus to producers in other countries and to raise prices to consumers in those countries.

However, if the income transfer to US producers is handled by means of deficiency payments, the result may eventually be lower global commodity prices because of the increased supply coming on to commodity markets at market–clearing levels. This would offset, at least in part, the effects of the rise in the value of the dollar. However, this fall in market prices makes the Treasury costs of the programmes increase and policy makers respond by pulling land out of production so as to raise market prices once again. The effect is to benefit producers in other countries.

Thus, US macroeconomic policies can have an effect not only on US agriculture, but on the agriculture of other countries as well. This is due to the significance of US agriculture in international commodity markets. Its impact will be determined by the extent to which other countries allow these effects to be passed to their domestic economies.

The second issue is the consequence of the international exchange rate regime being a bloc–flexible exchange rate system. In this system, the major currencies float relative to each other, but each one – and especially the US dollar – has a fairly large number of currencies whose value is fixed relative to the major currency. This gives rise to what might best be described as 'third-country effects' of exchange rate realignments. Thus, when a country such as Brazil pegs the value of its currency to the value of the dollar in real terms, it receives all the benefits and pays all the consequences of rises and falls in the value of the dollar. These benefits and costs are not relative to the US, but relative to other (third) countries.

Finally, there is the problem that foreign exchange rates are now driven largely by what happens in international financial markets, not by the trade account. As a consequence, there can be long and large swings in the value of a currency such as the US dollar which has little to do with the underlying comparative advantage of that country. Moreover, these large and sustained swings in the value of such a currency can mask underlying comparative advantages and for a significant period of time.

The US experience is insightful on this issue. In the 1970s the US was not nearly as inherently competitive in international commodity markets as its trade performance suggested. By the same token, it has not been nearly as lacking in competitive potential in the 1980s as its export performance would suggest. In both cases the value of the dollar was determined not only by US macroeconomic policies but also by developments in international financial markets. The consequences for other countries are obvious and quite real.

## CONCLUDING COMMENTS

The configuration of the international economy has changed dramatically in the last 20 years as international trade has grown, a well-integrated international capital market has emerged, and the exchange rate regime shifted from a fixed exchange rate system to a bloc-floating exchange rate system. These changes affect significantly the way we have to understand international commodity

markets, and the development of agriculture in individual countries. It is timely that we are now giving more attention to these issues. We need to remind ourselves, however, that we are barely scratching the surface of a world that needs a great deal more such research.

## NOTES

[1]For detail on these issues, see the chapter on agriculture, Council of Economic Advisers, *Economic Report of the President*, US Government Printing Office, 1975.

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## DISCUSSION OPENING – STEVEN C. KYLE

It is a pleasure to comment on Professor Schuh's paper, 'Macro Linkages and Agriculture: The US Experience'. In it he lays out a convincing case for the importance of exchange rates to agricultural performance in the US and the causal effects of macro policy in determining the direction and extent of changes in the exchange rate. I can add little to Professor Schuh's eloquence on this score, so I would like to focus on some aspects of macro linkages which I feel deserve greater emphasis, and then to suggest areas which merit more intensive investigation in the future.

Overall, I think that the scope of the paper is considerably narrower than the title suggests. Though I agree that the exchange rate is of paramount importance, macro policy also has powerful effects on agriculture through other channels which receive only passing mention in the paper. Basically, these channels can be thought of as those affecting prices and quantities in factor markets and those affecting relative prices in product markets.

Macro policy can affect the relative prices of land, labour and capital, as noted in the paper in the case of the relation of land prices to interest rates. Clearly, sustained policy induced deviations in these prices can have as strong an effect on the rate and bias of technical change as does the exchange rate. Of particular importance is the effect of interest rates, both because agriculture uses a high level of physical capital per unit of output and because the farm sector is a heavy user of credit. For commodities in which large stocks are held and in activities

where large amounts of capital are tied up in breeding stocks, the interest rate is an extremely important determinant of the level of activity. These effects remain important even in the absence of interest rate induced changes in the exchange rate. Similarly, the relationship of real wages to the prices of other factors and of consumer items can influence the rate of outmigration from the agricultural sector, as well as the factor intensity of production.

The effects of macro policy can also be felt in product markets where the terms of trade between rural and urban areas is a prime determinant of the returns to the different sectors. The recent literature on flex-price versus fix-price markets and the speed of adjustment to monetary shocks implies that there can be important effects of macro policy in this area in a closed economy context, in addition to the open economy effects noted by Professor Schuh. Clearly, as pointed out in the paper, fiscal policy can also have important effects, both in terms of sector specific taxes, subsidies, and price policies, as well as its effect on the interest rates and the current account.

What do all of these policy effects imply for the future of agricultural economic research? Though many feel that macro linkages are a relatively recent area of study for our field, their importance to farmers has been known for many years. The speeches of William Jennings Bryan ('Farmers are being crucified on a cross of gold') and the efforts of the populist movement in the last century to promote easy monetary policy via free coinage of silver show that this recognition dates back at least a century. Nevertheless, several important changes in the international and US economies have combined to move several issues to the top of our research agenda.

First, as Professor Schuh has rightly emphasized, the exchange rate will become increasingly important as the US economy becomes increasingly open to foreign trade. The apparent excessive volatility of exchange rates since the beginning of generalized floating in 1973 will continue as long as macro policies themselves continue to be volatile and/or different from those pursued by our major trading partners. Given a history of only 15 years of floating exchange rates, there is as yet relatively little evidence upon which to base conclusions.

Second, the interdependence of macro policies will be a fruitful area of research as a consequence both of the increasing openness of the economy and of the decreasing share of the US in world production. Indeed, in future years surveys of macro linkages to agriculture in the US are likely to contain a section named 'The Interdependence of Macro Policies' rather than 'The Effects of US Policies on Other Countries' as in the current paper. In particular, the EEC has become increasingly unified over time in terms of policy, and several newly industrializing countries will grow to positions of greater importance as well. These trends imply lessened ability for the US to conduct policy independently of the rest of the world, particularly since it is now the world's largest debtor.

A third area of importance is the increasing deregulation and integration of world financial markets. On the international level this forms part of the cause of our lessened policy independence, but also means that the US will become more dependent upon the decisions of foreign owners of our assets, both physical (land, factories, and so on) and financial. Though the proportion of total assets held by foreign owners is still relatively small, it can have a disproportionate

effect under circumstances where foreign holders act as the marginal holders of a class of assets, thus playing an important role in price determination.

Integration of capital markets is equally important on the national level as deregulation and mergers result in ever larger banks. The rise of such national banks may increase stability and efficiency but it also poses some uncertainties for the farm sector. It remains unknown whether such banks can or will be as responsive to farm needs as are locally based organizations. This is an area which requires further research in order for agricultural interests to be adequately represented.

A final area which requires additional thought and research is the micro foundation of macro phenomena. While in some sense, 'micro foundations' is merely another name for 'macro-agriculture linkages', in another sense it underlies much of the debate over the current fragmentation of the field of macroeconomics. In particular, the new classical school of macroeconomics has been much concerned with specifying the micro foundations of macro theories and though I do not accept many of their assumptions or policy prescriptions, it seems clear that more attention to the micro bases for macro phenomena is warranted. For instance, the micro foundations of differential response to monetary shocks inherent in fix/flex price models has remained relatively unexplored, while the long delayed response of the US trade deficit to large changes in the exchange rate suggests that there is more to the issue than mere realignment of the prices of traded goods.

We as agricultural economists have historically had a comparative advantage in the investigation of empirical questions on a micro level. Though we can no longer confine ourselves to the micro level, our strengths in researching these types of questions can add much to the more general debate over differing conceptions of the functioning of the macroeconomy.