

The Dangers of Monetary Policy in Agrarian Economies: A Comment

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In an interesting recent article in this Journal¹ Richard C. Porter presents a model "to show that, in agrarian (or predominantly agricultural) economies it may be *impossible* to counteract apparently temporary shifts in the price level by means of traditional monetary policy". In Section III, to which this comment relates, he assumes a two-sector model, with one sector (agriculture) producing the single commodity (foodstuffs) in the economy and the other sector living on lump-sum transfer payments from the agricultural sector and producing nothing. These lump-sum taxes are fixed and in money form; Porter in a footnote (p. 61) assumes (incorrectly, as is discussed below) that "none of the conclusions would be altered if the tax were fixed in real terms". Output is independent of economic considerations (determined by the "caprice of nature"). A fixed money supply is given, as is a desire to hold a certain real wealth balance relative to real income and consumption. Speculation on the basis of expectations of price changes is assumed away. The non-agricultural sector holds its real wealth only in the form of money, while the agricultural sector holds both money and hoards of foodgrains. While Porter grants that we know almost nothing about "what causes changes (and by how much) in the relative proportions of foodgrain stocks and money in rural wealth balances", his analysis rests entirely on presumed changes in this fraction. As he indicates, with an unchanging fraction, monetary policy is successful in maintaining a certain price level.

Porter considers an initial equilibrium position, with a certain price level, with both the agricultural and non-agricultural sectors holding the desired amounts of real wealth in relation to their real incomes, and with the wealth holdings of the agricultural sector divided in the desired fraction between real money balances and stocks of foodgrains. Suppose output declines temporarily (and with it agricultural real income); with reduced goods put on the market the price rises to a new temporary equilibrium. Now, suppose output rises to the previous level. Porter argues that the farmers are likely to re-attain their earlier real wealth positions by simply stock-piling their self-produced foodgrains, and in doing so raise the fraction

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¹. Richard C. Porter, "The Dangers of Monetary Policy in Agrarian Economies", *The Pakistan Development Review*, Winter 1961, pp. 59-72.

of their real wealth held in foodstuff hoards. Under these circumstances output available to the non-agricultural sector would not rise and the price level would not fall to its previous position. Why do the farmers behave in this manner? In Porter's words (and italics):

It may not seem reasonable at first glance that farmers should desire a different composition of wealth now than they did in exactly the same situation earlier (*i.e.*, before their output fell). But the situation is *not* exactly the same. Earlier they *held* a certain composition of money and foodgrains; now they must *re-establish* that composition and must *push down* the price of their merchandise to do it. Of course, the farmers do not know beforehand that they will drive down prices, but they will notice that prices are falling as soon as they try. It is very likely that they will then cease to market such large amounts and will become satisfied with holding a larger fraction of foodgrain wealth. (p. 64).

Such an outcome would militate against two of Porter's objectives: to restore the real income of the non-agricultural sector and to prevent retrogression in the monetization of the rural sector.

The last sentence in the quotation from Porter is crucial. Is it "very likely" that declines of prices below the high levels reached in a year of partial crop failure will make money balances less attractive and foodgrains more attractive as means of holding wealth? This analysis surely implies very peculiar assumption either about farmer behaviour or about the nature of competition in the agricultural sector. He does not state that there is a monopoly in the sale of foodstuffs nor explicitly make the assumption, which would be unrealistic in most underdeveloped countries, that any individual farmer has, or thinks he has, any influence on price through his sales². Moreover, he explicitly rules out expectational effects. Thus farmers will not

². If he does implicitly assume the existence of monopoly elements in agriculture, his analysis would have to be modified considerably. Under this condition it would be rational for monopoly farmers to withhold output by raising the fraction of foodstuffs in their total wealth in order to prevent a price decline, but for a reason that Porter does not specify. The lump-sum tax is in money form; the real income of the farmer is reduced if the price of foodstuffs declines, since the money tax transferred to the non-agricultural sector has a higher purchasing power. The logical conclusion would be for the farmers to band together and withhold virtually all of their output, so that the price would rise to its maximum limit. This limit in theory would be infinity, but this price would kill off all the non-agricultural population. For political reasons perhaps the maximum limit would approach that sufficient to provide just enough foodstuffs to the non-agricultural sector for subsistence with zero wealth balances. Thus, in a monopoly situation with lump-sum money taxes the farmers logically would not only want to maintain a certain high price level (derived from the previous decline in output) but would want to push the price as high as possible, subject to non-economic constraints (humanitarianism, revolt by the non-agricultural sector, government interference, raised taxes, *etc.*). While the proportion of money in their real wealth would likely decline, its real wealth would be sufficiently high that the agricultural sector would hold a larger share (perhaps all) of the money supply.

regard their own sales as reducing the price of foodstuffs. Why, then, will they cease to market their output? Porter granted earlier in his article that there is no economic difference between foodstuffs and money. When the farmer sells his output he obtains a lower price than had existed earlier (when output had declined), but by the same token the money he receives in exchange is worth more in terms of foodgrains. The opportunity cost of each (money and foodstuffs) is the other. From the viewpoint of the individual farmer who cannot influence price, his real wealth is the same in either case. Unless the farmer is irrational or has some peculiar illusion about the effect of the composition of his real wealth on its total amount, there seems to be no *a priori* reason why the farmer should behave in the manner Porter suggests, to hold more of his wealth in foodgrains and less in money.

The outcome envisaged by Porter becomes no more likely when expectations are taken into consideration. He might have argued, though he did not, that farmers would withhold supplies at any price below the peak reached after the crop failure because that peak price had come to be considered "normal", any drop below which would be expected to be followed later by a price rise, which would make money an inferior means of storing wealth. There could indeed be such a "reservation price", somewhat analogous to the Keynesian liquidity trap. But surely this would be at some level that was low by historical standards, not at or near the highest level attained in recent history. Price declines from the highest levels recently experienced are just as likely, if not more likely, to create expectations of further declines, which would counsel holding a larger rather than a smaller fraction of wealth in the form of money.

Thus, Porter has not provided plausible reasons why it is "very likely", or even likely at all, that farmers will not market foodstuffs as prices fall below their peak and that farmers will end up holding more of their wealth in foodstuffs and less in money balances than in the earlier period of equilibrium. He, therefore, has not made his case that a policy of holding the money supply constant in such circumstances will retard the monetization of agrarian economies. Suppose, however, that farmers do behave in the manner considered by Porter to be "very likely", diverting foodgrains into hoards and holding a smaller fraction of their real wealth in money. Let us analyze his policy prescription. He argues (p. 66) that the authorities should "accept the price rise as inevitable and increase proportionately (to the price rise) the money supply and the tax level. . . .". He validly states: "It will be possible for farmers to replenish their money wealth *without* forcing down prices." But he is on shaky ground when he adds, ". . . and there is no reason why they should not be willing to do so." Let us consider seriatim the proposed increases of the money supply and the tax level.

If farmers have decided to hold more of their wealth in foodgrains and less in money, what reason is there to believe that an increase in the nominal money supply will lead them to reverse the decision? One immediately becomes suspicious of any argument to the effect that increasing the nominal money supply will increase the demand of the community, or of any section of it, for real money balances and reduce its demand for stocks of wealth in other forms. Porter had already assumed that at any price below the existing level farmers would prefer foodstuffs to money as a form of holding wealth. But it does not follow from this that at the existing level of prices farmers would consider money balances a perfect substitute for foodgrain stocks. It seems strange to assume that there is an infinite elasticity of substitution in agricultural wealth balances at one price level and not at another³. Unless this additional assumption is made, Porter's prescription would lead to still further price increases. Farmers would offer more foodgrains for the additional money only at higher prices. And one is left to wonder why they should do so even then, for each unit of money would represent less purchasing power over foodgrains.

In fact, the long-run effects of following Porter's prescription of increasing the money supply proportionately with each rise of prices may be just the opposite of those he desires; they may be to increase the fraction of agricultural wealth held in foodstuffs and to decrease the fraction held in money. With any rise in output, the price level will never decline, since under Porter's assumption the farmer will prefer to hold increased real wealth balances as foodstuff hoards rather than in monetary form unless the price level is maintained through increases in the money supply. When output declines, however, prices will rise. Thus, there is an upward ratchet effect on the price level of foodgrains: with output increases prices will not fall and with output declines prices will rise. Even if farmers do not speculate on short-run expectations, they will surely learn in the longer run that by holding money balances they never gain and sometimes lose, but by holding foodgrains they never lose. This is hardly conducive to monetization of the agricultural sector.

Now let us look at Porter's analysis and prescription relative to taxes. First, it should be noted that he is wrong in stating (footnote to page 61), "none of these conclusions would be altered if the tax were fixed in real terms, *i.e.*, so much foodgrains rather than so many units of currency." With the tax fixed in terms of money, the real income of the non-agricultural sector falls with the decline of output and is restored only as prices fall.

³. If an assumption of monopoly power is injected, this question becomes relevant. If farmers will withhold supplies to prevent prices from falling, why not withhold supplies to raise prices?

But if the tax is fixed in terms of foodgrains the real income of the non-agricultural sector remains constant throughout; all changes in total output are reflected in changes in the real income of the agricultural sector. This would surely make for some difference in the extent of the price rise, in the distribution of wealth holdings between the two sectors, and perhaps also in the composition of the wealth balances of the agricultural sector.

But let us return to Porter's case in which taxes are fixed in terms of money and their amount is increased in proportion to the initial rise of prices. The purpose, of course, is to restore the real income of the non-agricultural sector. This will indeed be the result if farmers respond by selling enough additional foodgrains at existing prices to pay the increased taxes. In fact, if the farmers as a result of a once-only increase in money taxes return to the former proportion of foodgrains in their real wealth balances, then the original equilibrium and original price level will be restored without any change in the money supply. But since Porter has assumed that farmers no longer wish to hold the former amounts of real money balances relative to their income and wealth, this may not happen. Farmers may simply pay the increased taxes out of their money balances, holding as a limit all their real wealth in foodgrain hoards. To restore the real income of the non-agricultural sector under these circumstances it may be necessary to set taxes at a level high enough to absorb all the money balances of the agricultural sector and also to force farmers to sell enough of their hoards to reduce their foodgrain stocks to their initial equilibrium level.

Porter states (p. 66) that if both the money supply and money taxes are increased proportionately with the price rise, all the real variables of the system—consumption, real income, *etc.*,—will remain unchanged from their original equilibrium position. But this is possible only if, as seems to us unlikely, the increase in the nominal money supply induces farmers, at the existing level of prices, to restore their real money balances to their initial relationship to agricultural real income and real wealth. But if farmers persist in holding real money balances equal to only a smaller fraction of their real income and wealth, neither Porter's formula nor any other can restore all the real variables simultaneously. If it restores farmers' real incomes to the initial level, their foodgrain stocks will be larger and the real income of the non-agricultural sector lower. To bring the foodgrain stocks of farmers to their initial level and restore the real income of the non-agricultural sector, it would have to lower agricultural real income below its initial level.

Let us consider these issues in a somewhat broader context, going perhaps beyond the limits Porter set himself. Porter's article does raise in specific form the general problem of what happens to the price level and to monetization of an economy when for any reason there should occur a shift

in the proportion of real wealth held in monetary form and that held in inventories of real goods, given the money supply, level of money taxes (and government expenditures), level of output, and real consumption and real wealth functions. Suppose that, starting from equilibrium conditions, farmers decide to hold a larger share of their real balances in foodgrains and less in money, leaving unchanged the relation of their total wealth balances to their real income. During the period when farmers were shifting from real money balances to foodstuffs as a store of wealth, prices would rise for two reasons: the decrease of farmers' real money balances and their offer of smaller supplies on the market in order to increase their stocks. Moreover, with price increases and no change in the amount of money tax, the farmers would have a higher real income. After farmers had succeeded in raising their stocks of foodstuffs to the desired level, prices would fall somewhat as farmers were once again willing to sell more of their output. But prices would not fall to their former level both because the farmers' demand for real money balances remains lower and because with a higher real income they would consume more foodgrains and sell less than before. Thus, with unchanged levels of money taxes and money supply, farmers end up both with larger stocks of foodstuffs and a higher real income. At the same time the real income of the non-agricultural sector is reduced, within the period in which the adjustment takes place (since farmers sell less and prices rise) and thereafter (since prices fail to return to their original level).

In summary, the results of the farmer's shift to holding a greater proportion of his real wealth in foodgrains are: decreased monetization of the real wealth balances of the agricultural sector; a higher price level; decreased real consumption in the economy in the period of adjustment; and changed income distribution in favour of the farmers. If we assume that we cannot influence the farmers to change their new fraction of foodstuffs in their real wealth balances, how can we remedy the other results?

The decrease in real consumption within the period of adjustment is necessary because the increase in foodstuff hoarding is real saving. There are two alternatives: to eliminate the real saving and thereby restore consumption to its original level for all periods; or to shift (some or all of) the burden of decreased real consumption to the agricultural sector from the non-agricultural sector. The first alternative can be met, if farmers persist in holding larger stocks of foodgrains relative to their real income, by forcing down their absolute level of foodstuff hoards to its former position by using taxation to lower agricultural real income below its former level and then to keep it at the lower level. A mere restoration of the former distribution of real income between the agricultural and non-agricultural sectors would not lead farmers to lower their stocks of foodgrains to the old level. If the second alternative is decided upon, taxation can reduce farmer's real income

below its previous level initially enough so that their increase in foodstuff hoards would be just compensated by decreases in their own consumption. Eventually the desired level of foodstuff hoards is reached and taxation can be relaxed enough to allow the farmers their initial level of real income.

Suppose the authorities are unwilling to tax farmers heavily enough to force a reduction of farmers' holdings of foodgrains to the old level and instead aim only at restoring the real income of the non-agricultural sector. There are at least two ways of doing this. (1) Leave the nominal money supply constant, accept the higher price level resulting from the decrease in the farmers' demand for real money balances, raise money taxes enough to compensate for the rise in prices, and transfer these taxes to the non-agricultural sector. (2) Levy on the farmers a "once-only" tax equal to the original decrease in the farmers' demand for money balances and destroy this money. With equal decreases in the demand for and supply of money, prices will fall back to their original level after farmers have raised their stocks of foodstuffs to the desired level and again offer for sale the old fraction of their output. Of the two methods, we prefer the second, which in addition to restoring the initial income distribution, would also restore the initial price level. Admittedly, this will not necessarily induce farmers to return to holding only the farmer fraction of their wealth in the form of money. But we think Porter's prescription of increasing the nominal money supply in proportion to the initial price increase would be even less successful, for it would almost surely lead to still further price increases. It is suggested that price stability is not only compatible with monetization of the economy but is indeed most conducive to it. Upward ratchet-type price movements may eventually induce a flight from money into real inventories and tend to de-monetize the economy.

The difficulty with Porter's model is that it is not based on any clearly defined assumption or analyses regarding the farmers' division of real wealth balances between money and stocks of foodstuffs. What is required, and surely Porter would agree, is more understanding of such things as these: the relationships between real wealth balances of different groups and such variables as their real incomes and consumption; why these balances are divided in certain proportions between real goods and money; and to what stimuli and how strongly these proportions change. Without the advantage of such information, no model dealing with this problem can supply helpful hints to the monetary authorities.