171 7. <u>Allowing borh Prices aand Output to Change Together</u>.

7-1 <u>Introduction</u>. Neither the fixed price assumed in chapter
5 nor the fixed output assumed in chapter 6 is adequate.

But our method remains comparative statics: it compares
levels at different times. Only in chapter 8 will we be
able to examine the dynamic relationship between the rate
of inflation and the GNP gap or unemployment rate.

172 7-2 <u>Behavior of firms and workers in the labor market</u>.

<u>Figure 7-1</u>: The demand curve for labor plots the real wage (W/P)
vertically against labor input (man hours) horizontally.

The sloping red line measures the marginal product of
of added man hours. When the wage is \$4.00, $N*$ is the limit
to profitable number of man-hours: beyond $N*$ one is increasing
xx lossesx; short of $N*$ one is neglecting possible profit.

If the wage rose to \$6.00, the profitable number of
man-hours would move back to N'.

<u>Figure 7-2</u>: The Economy's Labor Supply Curve

A higher expected real wage induces individuals to raise
their supply of man-hours. But there is an upward limit:
few people are willing to work more than 100 hours per week
at any wage, because that leaves xxxh them with little time
for anything but eatx and sleeping.

$N^S(W/P^e)$ a curve that slopes upward

178 7-3 <u>The Aggregate Supply Curve</u>

The essential element to achieve higher output is an
xnxxxxxxxxxxxxxhxxpxxxxxxxxxxxxxxxxxThxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
increase in the price level (P) above the level workers
expect (P^e). The real wage expected by workers (W/P^e) deviates
from the current real wage calculated by firms (W/P) if
the price level (P) differs from the expected price level (P^e).

Expected real wage $\simeq W/P^e = (W/P)(P/P^e)$

Firms are interested in the current price of their output (P)
because they can sell immediately the worker's daily output.
But workers are interested in a futxxure expected price level
(P^e) because they xpaid by the month or by two weeks and
spend their money over the subxssequent or a longer period.

Imagine that the price level were to rise from 1 to 2 and that the nominal wage were to rise from $4.00 to $6.00. Then in the calculation of firms the real wage would be W/P, $6/2, = $3.00 but in the calculatione of workers it would be W/P^θ, $6/1, = $6.00.

<u>Figure 7-3 Upper Frame</u>: It starts by combining the labor demand curve from figure 7-1 and labor supply curve from figure 7-2. The verticalx axis isthe actual real wage (W/P), and this is the same variable upon which the labor demand curve depends, so that the labor demand curve can be copied from figure 7-1.

Since the ratio of actual to expected price (P/P^E) is not on thex axes, any change in this ratio shifts the labor supply curve.

The graft starts from the intersection at E_0 of the fixed labor demand curve and a labor supply curve drawn for correct expectations $(P/P^\theta) = 1. The original number of man hours will N^*, which is always the case when labor expectations are correct.

But if they prove incorrect and P_1 becomes greater than P_0, the ratio of actual to expected price rises to P_1/P_0. This shifts the labor supply curve to the right, and the economy moves from the initial point E_0 to the new position E_1. Now firms are willing to hire more labor since the real wage has fallen, and workers are willing to work at the old wage because they still expect the old price level.

<u>Figure 7-3 bottom frame</u>: relates price level on vertical axis and output (Q) on the horizontal: $SS_0(P_0^\theta)$ and $SS_1(P_1^\theta)$. Movement from E_0 to E_1 when actual P is above workers' expectations; and when expectations adjust to actual P, movement from E_1 to E_0'. output remains as it had been at Q^*, but prices are now at P_1.
(1) The SS curve slopes upward: when expected P is constant at P^θ, a higher level that is actual will lead to more hiring.
(2) Anywhere on any SS the price level is constant at P^θ
(4) When workers advert to actual price level, their expected level is (P_1^θ) and the SS curve moves upward.

Workers advertence to actual price level and revision of expectations brings N' back to N^* (frame 1) and Q' back to Q^*.

7-4 Forming expectations.

182   Expectations may not advert to new actual price level for
a full period, or they advert to part of an advance in price
level and adjust expectations partially. Step curve. Figure 7-4

184 $\mathbf{\underline{7}\_5}$ Short-run out$\mathbf{\underline{p}}$put and price effects of fiscal and monetary
expansion.

The DD curve will move to the right and upward when
$\bar{A}$ increases because of government purchases increase, autonomous
transfer payments increase, autonomous taxes decrease, business
and consumer confidence improve, a reduction of income tax
increases the muliplier, nominal money supply increases.

If prices remained constant, the movement would be from
E_0 to K; but while K is on the DD curve, it is not on the initial SS.

At E_1 the new DD intersects with the initial SS, and
operations will continue here, until workers revise their
expectations, and their results a new SS curve and a further
heightening of P.

This process is repeated until successive revisions have
brought the economy to E_3 where $P = p^e$ and SS and DD also intersect.

188 7-6 Shifting expectations and the long run supply curve.

With every revision of p^E there results an upward translation
of the SS curve.

There is a short run equilibrium when the level of output
balances the demand for commodities without inventory accumulation
or decumulation; and the price level, P, must be sufficent
to make firms able and willing to produce the level of output
specified by the DD curve; this can happen only along an SS
curve specified by current expectations (p^E).

The equilibrium at the intersection of DD and SS is not
permanent if actual real output (Q) is either above or below
natural output ($Q*$), since the actual price level then
will differ from the expected level, leading to a revision
of expectations.

There is a long run equilibrium only when all three
schedules intersect (DD, SS, and QQ).

187The effect of a shift in aggregate demand in long-run equilibrium
is this chapter is exactlmy the same as the pergfectly flexible
price case of chapter 6 (? 6- 3)

7-7   Conditions required for a continuing demand-pull inflation

Inflation is an upward movement in prices that is shared
by all components of the price deflator and is sustained.

A demand-pull increase in the price level can be initiated
by any event that shifts aggregate demand and the DD curve to
the right, thus pulling upward on the price level. A one-shot
monetxxary stimulus, an increase in real government spending,
a cut in taxes, or an increase in business and consumer optimism
are all capable of shifting DD and so are capable ms of initiating
a demand pull increase in the price level.

But a continixuing inflation asks for more, namely, a
continuing movement to the right of the DD curve. Such a con-
tinuing movement is possible only if the money supply is
continuously increasing.

Every sustained inflation has a monetary connection.
But this does not imply that every sustained inflation was
initiated by the Fed. However the Fed may be induced increase
the money supply: figure 5-6 shows P rising because of
fiscal action; figure 5-9 shows how increasing M^s/P prevents
a rise in interest rates. Also see below on cost-push.

Cost-push and Supply Shocks

Suppose workers demand that their nominal wage be
doubled. If their demand is met the SS curve moves up
vertically, but if $\bar{A}$ and M^s remain unchanged, the DD xxm
curve will remain where it is, and the ecommnomy moves
up DD to the pmxk point G where the new SS cuts the initial DD.
The pr$ice index has risen from p_0 to p_1 and production
has decreased from $Q*$ to Q'. Why? The rise in P reduces M^s/P,
the real balances, and this reduction calls a reduction in
the demand for money and so in production.

If the Fed stands firm, the aggressive workers are worse
off, because output declines as the economy moves from E_0 to G,
production is cut, xm and some workers are laid off. The
price level increases but not by the full extent of the new SS curve.

The cut in production allows firms to discharge low productivity
workers, so that marginal cost increases by less than the
doubling of wage rates.

Why would a labor union demand such an increase in wages
at the cost on unemployment of some of the workers. Part
of the answer may be internal union politics. The workers
most likely to be laid off are youngest (last hired, first
fired)), and the majority of the union members may be older
workers who have sufficent seniority to be free from concern
about the possibility of a layoff,

But the union members may escape without any layoff.
The Fed may choose to maintain full employment by adjusting
the money supply. The economy can be pushed north east
from G to E_3 if the Fed allows the money supply to double
from M_0^s to M_1^s. At point E_3 the price level and the money
supple have doubled leaving the real money supply unchanged
and avoiding the need for any further decline in the demand
for money and in output. The Fed by having allowed the
cost-push action of the union to raise the price level
without unemployment resulting, is said to have ratified
or accomodated the cost-push.

Point E_3 however is not likely to be the end of the story.
The problem is that workers have not accomplished anything.
They have doubled the nominal wage but the price level
has also doubled to leave the real wage (W/P) unchanged.
If the workers conclude that wages must be doubled once more,
the consequences outlined above will follow.

The distinction between cost-push and demand-pull is
largely spurious. A shift in either SS or DD moves the
equilibrium position from point E_0 to E_3 or E_4, and further
points north. The only difference is initially a demand-pull
moves the output along a path from E_0 through E_1 to E_3
top frame of figue 7-0) if expectations are slow to adjust,
while cost-push output along the path $E_0 G E_3$ if the Fed

delays augmenting money supply or refuses to do so.

.. even in most classic wartime or postwar money fueled
inflations, the role of the monetary authority has been
passively to finance deficits arsing from the inability or
unwillingness of politicians to finance expenditures through

193 increases in conventional taxes. Keynsian fiscal-induoed money-accomodated inflation and "pure" money-iniated inflation in almost all historical cases amount_ed to one and the same thing.

> Thus, am more general view is that inflation results from the passivity of the monetary authority in the face of pressures emanating from all groups in society - workers, firms, and governmemt.

In 1973 and 74 the US experienced a new kind of cost-push inflation. Poor harvests and buoyant foreign demand caused the prices of raw agricultural material to double in 1973, forcing up the price of food in supermarkets. Then in early 1974 the price of an oil was quadrupled by OPEC, forcing up prices paid by US firms and consumers paid for gasoline, motor oil, heating oil, chemicals, and other products.

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A third inflationary impetus was provided by the 1971x and 1973 devaluations of the dollar, which raised the dollar price of goods imported frxm into the US relative to the foreign currency price of those nations producing the goods. Since the higher prices of food, oil, and imported goods raised the level of the price deflator (P) above the expected level (P^e), the economy's SS curve shifted upward, just as in the bottom frame of 7-6. But the outcome differed from the illustration, for the Fed refused to raise the level of the nominal money supply (M^s). The economy's real income was allowed to decline, and workers were laid off. By May 1975 unempxloyment reached a postwar peak of 9.0 %.

Many economists now use the phrase, supply shamocks, to refer to crop failures, increases in commodity prices oaused by a cartel, and other unforeseen events that raise the price necessary to induce firms to produce a given amount.
Cf. case history ↓

196 The behavior of the price deflator (vertical) and the ratio of actual to natural output ($Q/Q*$) in two wartime episodes (Figure 7-7) and in four post war episodes (7-8).

199 7) Most inflationary episodes in US history (except 1973-75) appear to have been initiated by an increase in aggregate demand.