CHAPTER FIFTEEN

EXOGENOUS MOVEMENTS

The processes of movements treated in the preceding chapters are all endogenous or primarily endogenous in character. This applies to the process of general, or trend, development, in particular to the extent that it is determined by capital accumulation; it applies also to the processes of inflation and of business cycles. This type of movement has in general received much more attention from economists than have the processes which are primarily exogenous in character. Among the latter, we may mention some aspects of the general long-run development (the effects of increases in population and of increases, or decreases, of natural resources), all seasonal and similar movements, a number of the random movements (for instance, those which result from changes in crops), and some sudden changes of economic structure. All these movements are approximately exogenous; approximately, because for a strictly exogenous movement to occur, it would be necessary, as we have seen in chapter ix, that all adaptations of the economic variables take place without any time lag. It is possible to extend the field of exogenous movements arbitrarily, by concentrating the study on sufficiently small parts of the economy. The smaller the part, the larger is the number of influences which come from the outside; and if the reactions of the economic variables in the small segment of the economy under consideration are rapid, the movements may appropriately be described as exogenous.

The method usually applied in the study of exogenous movements is that of comparative statistics. This method indicates in principle the new equilibrium which will be established, in the segment of the economy under consideration, for every change in the data. If the equilibrium establishes itself rapidly, the par-
ticular segment will indeed pass through a number of successive
different positions of equilibrium; the method of economic statics
will therefore be adequate to describe and explain these
various positions.

The method of comparative statics will be most satisfactory
when the changes in the data are slow and all in one direction.
In those situations, the possibility of the adaptation of the eco-
nomic variables to the data is greatest. Strictly speaking, the
laws of economic statics are applicable only if the new position
of the data satisfies these two conditions: (1) it is known also for
the future and (2) it will be always the same in the future. Eco-
nomic statics is less permissible when (a) the position of the
data in the future is unknown and/or (b) the position of the data
in the future is known but does not remain the same.

In the first case, there will be different assumptions concern-
ing the future position of the data each with its own probability;
this introduces the concept of risk. This situation occurs, for
instance, in markets of agricultural products as a consequence
of changes in crop yields. We shall demonstrate with a simple
example the type of deviations from those expected on the basis
of economic statics that will occur in the explanation of move-
ments in these markets.

Let us assume that there has been an unusually large cotton
crop. If one were to explain the phenomena which follow—low
prices, a larger quantity sold, etc.—on the basis of comparative
statics, it would be necessary to assume that in the future the
cotton crop would be in every year as large as in this one year.
The amount of the reduction in price could then be read from
the demand curve for cotton; the price would have to be at such
a level that a quantity equal to this single large crop could be
sold every year. The quantity sold would increase by the full
increase of the crop.

This assumption, however, would be quite unrealistic. It
should be replaced by a different assumption, namely, that
after this large crop a number of crops of unknown size will oc-
cur in the future, with an equal probability of excessively large
and excessively small crops and with the greatest probability
of an average crop. The assumptions of economic statics are now
no longer applicable; in particular the price, the quantity supplied, and the quantity demanded will now no longer remain unchanged over time. Demand and supply relationships will have to be made considerably more complicated, for the quantity supplied and demanded will now depend not only on the current price but also on the expected future prices. If, in a case like this, one desires to study the deviations between the results of statics and dynamics, it is a good practice to study first the simplest possible case which has the minimum of new features. In this particular case, that is possible without going far from reality.

We assume now that on the demand side the influence of future prices may be disregarded; the demand curve for economic statics continues therefore as valid. On the supply side, on the other hand, we assume that the prices of the current and the next crop years enter into consideration but not the prices of years further ahead. We might express this by saying that the suppliers have a "horizon" of two years. With respect to the price expectations of the suppliers we may now distinguish three cases: (1) they expect higher prices for the next year, (2) they expect lower prices for the next year, and (3) they expect the same prices for both the current and the next years.

In the first case, suppliers would reserve their entire supply for the following year and supply nothing in the current year; in the second case, they would supply everything in the current year and supply nothing in the next year; whereas in the third case, it would be indifferent to them in which year they offered their supply. It will be noted that we have disregarded the costs of storage connected with the retention of part of the supplies; it would not be difficult to take these costs into consideration but, in order to keep the case as simple as possible, we leave them for the moment out of account.

Expectations (1) and (2) are illogical because of the consequences to which they would lead. If all supplies were kept for the succeeding year, prices would rise very strongly and would be higher this year than next, in contrast to the assumption itself. Similar considerations apply to case (3). Therefore, if we make the further assumption that the expectations should be
compatible with economic common sense, only the third possibility concerning the expectations remains. If we assume a static demand curve, this assumption is compatible with economic common sense only if the quantity supplied is equally distributed over the two years. In this case, therefore, not the entire extra crop will be supplied in the first year, but half the surplus in excess of a normal crop will be kept for the succeeding year.

In the next year, as soon as the crop is known, the suppliers will again establish a supply plan for the two-year period which has then started. In this plan, the supply for the first year of the period, that is, the second year of the previous planning period, may be different from what would have been anticipated the year before. Again, however, half the total supply expected for the two-year period will be offered in that year, and the other half will be reserved for the third year. The total expected supply for the two-year period will be equal to the actual crop in the second year, plus the surplus carried over from the first year, plus the expected, normal crop of the third year.

Hence, as a consequence of an unusually large crop there will be an increase in supply not equal to the surplus above normal but equal to half the surplus above normal. If one had assumed that suppliers looked ahead not two years but three, one would have found that only one-third of the surplus would be supplied and that the remaining two-thirds would be added to stocks.

There is thus a clear difference between the results of comparative statics and those of the first simple approximations of dynamics. These first approximations make it possible to describe the actual events in the market much better than would be possible with the aid of statics alone. It is not difficult to proceed to a second and to further approximations, for instance, by taking account of the cost of storage or of the effects of an unusually small crop. It would lead us too far, however, to go into further details here.

Case (ii) mentioned above, where the position of the data in the future is known but does not remain the same, is applicable in particular to seasonal movements. To the extent that one limits the discussion to normal seasonal movements, it may ac-
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tually be stated that these can be anticipated. Economic sub-
jects plan their actions in response to these known seasons, and
this will lead to systematic deviations from what would be ex-
pected on the basis of economic statics. These movements can be
understood with the assistance of approximately the same the-
oretical methods as those employed in the preceding para-
graphs. The only difference is that in this case the expectations
are not uncertain and hence that no account has to be taken of
a probability distribution of the expected values.

If, for instance, the demand for coal declines during the sum-
mer, mines will not have to reduce their production by the full
decline since they know that demand will again be higher dur-
ing the next winter. In part, therefore, they will produce for
stock and thus bridge over the dull season.

The large supply of eggs in the spring that in earlier years was
marketed almost entirely—as a consequence, the price used to
fall very sharply—will now in part be preserved since the tech-
nical means are available, because it is practically certain that
the supply in the fall will be very much lower.

The effect on the price of such a seasonal excess supply, there-
fore, will be entirely different from the effect of a permanently
increased supply as a consequence of a larger number of hens or
of lower prices of chicken feed. The latter cases may be treated
with the help of static demand curves; the former case of sea-
sonal supply cannot be treated in that way.

For most fresh vegetables and fruits, however, the situation
of comparative statics is still very closely approximated, be-
cause the preservation of fruits and vegetables is much less ex-
tended than that of eggs.

It follows from the above examples that the field of applica-
tion of comparative statics is much more limited than one might
think at first. The adaptation of economic variables sometimes
occurs rapidly but not completely in those cases where the new
value of the data is not considered as permanent. In those situ-
atations, economic variables show fluctuations parallel with those
of the data but not with the intensity that would be expected
on the basis of comparative statics.