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The International Transmission of
Business Cycles

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Nr. 14

The International Transmission of Business Cycles

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I. - Shaping a Framework for Our Question

1. If one considers the international transmission of business cycles it is advisable first to find out what generally adopted theories say on this point. Having had a look on theories concerning the international exchange mechanism we conclude that two fundamentally different forms of adjustment systems exist. For one we have a system of fixed or pegged (to anything you like) exchange rates between the countries under consideration. This system expects in turn that internal elements of each country bear the burden of the adjustment in order to keep the national economy in some sort of international balance.¹ On the other hand, it is possible to use flexible exchanges as² means through which the adjustment is to take place; in the second case one is preserving the internal policy measures for purely national purposes. As far as monetary policy is concerned the latter system: "opens up an entirely new dimension for monetary policy."²

2. There is nothing new about this argument. It has, actually had a great number of forerunners. To mention only two we first cite J.M. Keynes with his Tract on Monetary Reform of 1923³. There he says "that under the pre-war regime, under which the rates of exchange between a country and the outside world were fixed the internal price level had to adjust itself, i.e.; it was chiefly governed by external influences."⁴ Whereas under a regime of flexible exchange rates the price level mainly depends on internal influences.⁵ This line of reasoning is also adopted by Gottfried Haberler when he says: "Governments generally choose to stabilize either the price-level or the rate of foreign exchange." "... if in foreign countries the price-level is rising or falling, the country in question is faced with the dilemma of either stabilizing the exchange rate and letting the domestic price-level move in sympathy with the foreign price-level, or stabilizing domestic prices and allowing the exchange rate to move in inverse ratio to the movement of the foreign price-level."⁶

The last sentence brings out one point in an especially clear manner. For, if price-level movements reflect the movement of a business-cycle, one can validly conclude that with fixed exchange rates business cycles in one country spread to the outside world. This sort of reasoning appears plain and plausible so that it became widely accepted theory. We are, therefore, not surprised at seeing that the German Council of Economic Advisers in his latest "Jahresgutachten" ⁷ time and again refers to the Bretton-Woods' system as one that constrains national autonomy in stabilizing policies, whereas a system with flexible exchange rates creates full autonomy and does not constrain any policy measures for stabilizing purposes. ⁸ The last point, that flexible exchange rates allow a national independence from outside influences, is also often referred to in the discussion on the reform of the international monetary system. ⁹

3. It was thus far the pure argument that we presented. There might be some reservations about it; more exactly there are some. In the case of flexible exchanges we have the statement of Laursen and Metzler that terms of trade changes can restrict the full independence from outside business cycle movements, ¹⁰ because devaluations and revaluations always alter the terms of trade to some extent and it is thus not any longer clear, on an a-priori basis to judge the combined effect. On the other hand with fixed exchange rates, the transmission of imbalances or even whole business cycles can be hampered by policy measures taken by central banks of the countries concerned. ¹¹ Herewith is implied that the monetary authorities simply counteract the tendencies of national money supplies to rise or fall as is necessary for balance of payments equilibrium. In reviewing the last century of exchange-rate regimes P.B. Kenen and R. Lubitz conclude that after World War I, i.e., during a time with fixed exchange rates, "all central banks had found new ways to contravene the rules of the game". ¹² All that the "rules" of a fixed exchange-rate system had required was that the quantity of money decreases in the reserve-losing country and vice versa in the reserve-gaining country. ¹³

4. But were the "rules of the game" always obeyed? Or has on the other hand, the outside influence for some countries been so strong, that these countries could not evade it, even if they wanted to do so?

This last question is answered in the affirmative by S.W. Arndt and Th.J. Courchene in the Comments they make at the 1969 Conference of University Professors. Arndt, e.g., argues: "A large country such as the United States is in a very different position. Its impact on world trade and finance is so disproportionate that it becomes difficult to separate stability or instability of the World economy from that of the United States".¹⁴ The argument of Courchene follows similar lines when he contends that movements in US output and prices will generate changes in output and prices elsewhere.¹⁵ While both these arguments don't explicitly refer to any empirical evidence, G. Macesich finds from data for the case of Canada that: "The Canadian economy still remains sensitive in the 1960 to external disturbances."¹⁶

Also relying on empirical evidence Keran reaches a result for the Japanese economy, that stands in marked contrast to the three statements above. He concludes that Japan has been relatively little affected by fluctuations from abroad in the postwar period, and adds: "Thus, the popular saying that when the U.S. sneezes Europe catches cold and Japan is confined to its bed doesn't seem to hold".¹⁷

What is especially interesting about Keran's arguments is the fact that Japan exhibited, fixed and unaltered exchange rates throughout the period under consideration. There is thus an obvious difference between the statements of at least the pure theory and the evidence. What will be our task now is to look for further evidence in countries that are relatively dependent from the outside world and especially from the United States. The evidence will consist in a comparison of business cycles in the United States and the five countries: Germany, France, U.K., Japan and Italy respectively. According to the pure theory of fixed exchange rates the United States economy as the largest western economy ought to have a dominant influence on the

countries mentioned, what would result in an obvious parallelism of respective business cycles. The parallelism will be tested by quite simple comparisons and by regression analysis.

One might wonder, why we include Japan once more and don't rely only on the evidence cited by Keran. The reason is, that we have another argument stated by M. Michealy which concludes that Japan conducted its monetary policy according to the "rules of the game" of fixed exchange rates.¹⁸ And according to the theory Japan then ought to exhibit a strong parallelism between its business cycles and those in the United States. But this obviously has not been the case. Therefore we shall have to reconsider the case of Japan.

5. The task we want to undergo is not a new one. Oskar Morgenstern had nearly the same intention - only he concentrated himself on the periods 1870-1914 and 1925-1938.¹⁹ His results were that there existed a clear parallelism of business cycle movements between U.K., Germany and France before World War I. The United States, then, were much less interrelated with the aforementioned countries.²⁰

For the period after World War I this setup is quite different. The percentage of simultaneous and parallel movement is generally much reduced and the order of magnitude between pairs of countries is reversed. Morgenstern thus concludes: "This expresses a greater independence of movement, a decrease of prewar harmony, if this word be permitted."²¹ "In general in the prewar period the United States cycle led those of the three European countries at both peaks and troughs... No consistent timing relationship appears among the three European countries. After the war the pattern was less definite although the United States cycles continued to lead British and French cycles at peaks. These comparisons lend some support to the notion that the United States 'exported depressions'...²⁴" For an outlook in the period after World War II Morgenstern suggests a further loosening of interrelation and still less parallelism of movements.²³ Whether he is right or not will become obvious from our analysis.

6. For this task we intend the following procedure. First we shortly describe the cycle pattern of the United States, Germany, France, U.K. and Japan. Throughout we use quarterly data of nominal GNP. If not available ²⁴ estimates have been derived on a quarterly basis. We intended to restrict ourselves to the period 1950 up to the latest date for which information was available at the time of its collection, usually the end of 1970 or the beginning of 1971. The early postwar years 1945-49 were excluded for lack of data and because of the unique circumstances of those years. Nevertheless, not all GNP series cover the whole period for which we wanted to have data. Therefore the starting years of our series often are different. This fact, however, does not seem to interfere with our purposes, for there are still enough data for each variable we are considering - even if sometimes the first years of the fifties escape our view. But anyway these first years of the fifties are by no means the most interesting. For, then, the countries still had to suffer from wartime damages and those years accordingly can't be called "normal" as seen from respective countries.

Next to GNP-series we collected data on national money supplies. The series - we were interested in - correspond to the narrow definition M_1 as it is familiar from modern monetary theory. ²⁵

A further step in our analysis was to compute growth rates both from GNP and money-series, so that we could plot the movements of the curves and realize, from that, the respective cycles.

Chart I through Chart V represent each GNP and money supply growth rate movements of the five countries during the post-war period which was covered by our data. For instance, Chart I reflects the development and the cycles in the United States since 1950 in its GNP and its money supply. What is intended with these Charts I - V is for one to present the cycle pattern of our five countries and simultaneously we tried, on the other hand, to check a possible explanation of the respective business cycles - it is here

the monetary hypothesis.²⁶ Throughout the latter is, at least, not refuted.

In Charts VI through IX we tried to compare the business cycle movements of Germany, France, U.K. and Japan with those of the United States. This is one of our main tasks in the present case on the ground that if there exists a transmission of business cycles from the United States to the other countries, at least some sort of parallelism should become evident from those charts. If there is none we shall reject the hypothesis that the postwar fixed exchange rate system caused a spread of business cycles emanating from the United States. If, however, the picture turns out to be the other way round the case can't be settled with equal ease. For then we ought to analyze first possible transmission mechanisms before we can arrive at some conclusion.

II. - An Over-All View of Business Cycle Patterns

1. Now, let's turn to charts I - V, where the growth rates of both GNP and money supply are plotted. In order to distinguish cycles, which we measure from trough to trough, we posit the following criteria: There must be at least a three quarters uninterrupted movement in only increasing or decreasing direction in order to be called upswing or downswing, respectively. Accordingly a trough or a peak imply such a lasting change in the direction of the development of growth rates. Even if these criteria don't seem to be very strong we'll realize a few cases, for which the criteria still are too restrictive. In those cases, however, we always try a tentative explanation for our failure to stick fully to our general criteria.

2. First some words concerning postwar business cycles in the United States are necessary. For this purpose we refer to curve 1 in Chart I. If we measure one whole cycle from trough to trough we can recognize six cycles. The first trough occurs in 1952 III. From then on we have an increase in growth rates during three quarters till 1953 II and a succeeding heavy fall in GNP-growth rates, even into the

negative range, until a new trough is reached in 1954 II. The first cycle thus spreads over seven quarters. The following business cycle covers a much longer period. It reaches its peak in 1955 III and its trough in 1958 I. The entire duration of this cycle amounts to fifteen quarters. The third cycle under consideration comes to an end in 1961 I and thus covers just three years. In 1963 II, after only nine quarters, another trough, that is much less marked than all others, is to be made out. From then on a longer cycle begins that comes to its end in 1967 II. A last cycle covers fourteen quarters till 1970 IV. Table I shows all six cycles together and lists the times of upswings and downswings respectively.

A general feature of the three last cycles is the fact that they are less intensive than the preceding ones. This is especially obvious from the relatively mild downswings that never reach negative growth rates - whereas at the first three troughs zero, or even negative, GNP-growth rates are to be found. One might, therefore, conclude that with the beginning of the sixties some change took place in the political or institutional arrangements of the United States.

Table I

Postwar Business Cycles in the United States

Cycles	Duration in Quarters		
	Whole Cycle	Upswing	Downswing
1952 III - 1954 II	7	3	4
1954 II - 1958 I	15	5	10
1958 I - 1961 I	12	5	7
1961 I - 1963 II	9	4	5
1963 II - 1967 II	16	11	5
1967 II - 1970 IV	14	4	10

As can be seen from curve 2 of Chart I the growth rates of United States' money supply also show a clear cyclical behavior. The first cycle starts in 1951 II and comes to its

end in 1954 II. Thereafter we can distinguish another cycle in money supply growth rates that covers the period till 1958 I. Both these cycles move just parallel to the business cycles, with slight deviations at the peaks, peaks in GNP-series succeeding money supply series. The third cycle covers a period of 10 quarters with its end in 1960 III. The following cycle has only a rather mild downswing of three quarters. It is terminated in 1962 IV. From then on starts a long cycle, covering 17 quarters and stopping in 1967 I. The sixth - and also last - cycle comes to an end in 1970 I. In Table II we list all six cycles in money supply growth rates.

Table II

Postwar Cycles in Money Supply Growth Rates in the United States

Cycles	Duration in Quarters		
	Whole Cycle	Upswing	Downswing
1951 II - 1954 II	12	3	9
1954 II - 1958 I	15	4	11
1958 I - 1960 III	10	4	6
1960 III - 1962 IV	9	6	3
1962 IV - 1967 I	17	14	3
1967 I - 1970 I	12	8	4

What is apparent from both series taken together is the strong parallelism. Troughs in GNP-series mostly coincide with troughs in money supply series - the greatest deviations being three quarters. The peak in GNP-series succeeds money-peaks in the first three cycles, coincides with it in the fourth and precedes them in the last two cycles under consideration. The greatest deviation is a lag of five quarters in GNP-series. The maximum lead at peaks or troughs consists of three quarters.

What is relevant at this stage is only the clear-cut parallel movement of both series in the United States. We need not yet interpret this parallelism in any causal way.

3. In the GNP-series of Western Germany we can find only three full cycles in the period from 1951 till 1971.²⁷ For this the reader may refer to curve 3 in Charter II.

The first postwar trough occurs in 1954 I. The next is to be found in 1959 I after 20 quarters or five years. In 1963 I we have another trough that terminates the second full postwar cycle. The fourth and heaviest trough occurred in 1967 III. This downswing is the only one, during the period under consideration, that brought about negative growth rates in the GNP of Germany. We can thus list three business cycles in Germany in Table III.

Table III

Postwar Business Cycles in Germany

Cycles	Duration in quarters		
	Whole cycle	Upswing	Downswing
1954 I - 1959 I	20	6	14
1959 I - 1963 I	16	4	12
1963 I - 1967 III	18	4	14

Generally remarkable is the relatively short duration of the upswings in the three cycles, whereas the downswings take on the average thrice the time until they reach after some erratic movements the final trough. Only the upswing following 1967 III clearly takes a longer time and leads to its peak in 1970 II after eleven quarters.

Money supply in Germany has a small trough²⁸ in 1954 II, as is apparent from curve 4 in Chart II. A clear cycle in money supply-growth rates starts, however, in 1957 I and reaches its end in 1961 I. The following, shorter, cycle covers only nine quarters till 1963 II. A further cycle in the German money supply, which does not contain a sufficiently marked peak, stops in 1967 II, i.e., just one quarter before the greatest German GNP-trough.

Subsequently a last cycle is to be found which is terminated in 1970 III. Thus, we have five cycles in the money supply whereas only three in the GNP series. The five cycles are listed in Table IV in the familiar way.

Table IV

Postwar Cycles in Money Supply Growth Rates in Germany

Cycles	Duration in quarters		
	Whole cycle	Upswing	Downswing
1954 II - 1957 I	11	7	4
1957 I - 1961 I	16	4*(10)	12*(6)
1961 I - 1963 II	9	3	6
1963 II - 1967 II	16	8	8
1967 II - 1970 III	13	9	4

*It could be equally possible to take 10 quarters upswing and only 6 quarters downswing, because after the first peak follows another which is slightly higher and from which on the unimpeded downswing starts.

If one compares the development of both German series one can find from Chart II, albeit the different number of clearly established cycles, a strong parallelism between GNP-growth rates and money supply growth rates. Curve 3, i.e., the German GNP-series, normally lags the development of the money series, though this seems to be not always true in trough-situations.²⁹ Moreover, one can make up a relatively wide variation in the lag of both series. During the heaviest German slowdown after the war in 1966/67 the money-series leads just one quarter, whereas during the period 1957-1960 the maximum lead totals eight quarters or two years. The parallelism between the two series is thus somewhat blurred, though it is clearly present.

4. Chart III shows the situation in France. Because of heavy erratic movements in the GNP-series we hesitate from the very beginning as to the unmodified adoption of our cycle criteria. For instance, our criteria say that 1953 I

is a trough. But the figure of curve 5 suggests that 1954 I would be a better date to give this name. We decided to fix the first full cycle under consideration from 1954 I to 1959 I. The following covers the period till 1965 I. After this date no clear picture of another business cycle can be found. Table V thus reports only two cycles in postwar GNP of France.

Table V

Postwar Business Cycles in France

Cycles	Duration in quarters		
	Whole cycle	Upswing	Downswing
1954 I - 1959 I	20	16*	4*
1959 I - 1965 I	24	20*	4*

*If one looks at Chart III one can recognize the arbitrariness of our procedure in fixing the number of quarters for up- and downswings.

According to our cycle-criteria the money-supply series of France, plotted as curve 6, shows a much more clear-cut picture. The first cycle starts in 1954 I and comes to an end in 1957 I. Thereafter follows a very short cycle of just six quarters till 1958 III. Then we find a cycle of rather long duration which does not stop before 1964 I. While this cycle is characterized by heavy variations in growth rates the succeeding cycle shows only a slight upward movement whereas its downswing is distinct. Thus a further trough is reached in 1968 I. Two years later, in 1970 I, the last full cycle in our data period is terminated. Table VI lists once more the important cycle characteristics.

Table VI

Postwar Cycles in Money Supply Growth Rates in France

Cycles	Duration in quarters		
	Whole cycle	Upswing	Downswing
1954 I - 1957 I	12	6	6
1957 I - 1958 III	6	3	3
1958 III - 1964 I	22	11	11
1964 I - 1968 I	16	8	8
1968 I - 1970 I	8	4	4

Especially interesting is the equal distribution of time in all growth rate cycles of the French money supply between upswings and downswings. Nothing of this sort happened neither in the United States nor in Germany.

Our last task in the description of the French cycles is to look for some evidence for a parallelism between the series, something that seems to be extremely difficult if one only considers the number and duration of the cycles. But, nevertheless, one can recognize from Chart III that there exists a certain lag structure between the rows - still more exactly: a downward movement in the money series leads a downward movement in GNP growth rates - the lead amounting to nearly two quarters. Expansionary movements of the money supply are following by upswings in GNP-data; but the lag appears to be somewhat longer than it is with the downswings. What we can conclude by mere description is a sort of lagged parallelism between the two series, even if the lag, unfortunately, is not constant in every direction.

5. Postwar cycle pattern in Japan is extremely interesting. It resembles a bit a dampened cobweb - cycle pattern for, until the early sixties, one can recognize marked upswings and downswings whose amplitude and duration evidently diminishes subsequently what is evident from curve 7 of Chart IV. The first full cycle that is covered by our data starts in 1955 II and comes to an end in 1958 II. The following cycle whose trough still shows a growth rate of more than

six per cent ends in 1963 I. Thereupon we have a much less marked cycle both in duration and in amplitude; it stops in 1965 III. The next one is still more trifling. It has a duration of just two years and is followed by an even smaller but still recognizable cycle of six quarters. Thus our cycle - Table is as follows.

Table VII

Postwar Business Cycles in Japan

Cycle	Duration in quarters		
	Whole cycle	Upswings	Downswings
1955 II - 1958 II	12	8*	4
1958 II - 1963 I	19	14	5
1963 I - 1965 III	10	4	6
1965 III - 1967 III	8	4	4
1967 III - 1969 I	6	3	3

*Here we have nearly the same problem in determining the "true" peak as we had in the case of the German GNP-series in 1960-1961.

The cycle pattern of Japanese money supply, plotted as curve 8 of Chart IV, does not show the same behavior as the GNP-series in every respect. Clearly parallel are its heavy swings in the fifties and early sixties. But the first cycle in the fifties, that dures from 1954 III till 1958 I is obviously not the most marked. This actually, is the third cycle from 1962 II till 1964 IV. Thereafter money supply growth rates don't any more exhibit a neat cycle pattern. With some kind intention one can make up another cycle that comes to an end in 1968 I and a last cycle stopping in 1970 IV. This gives Table VIII:

...parallelism between the two periods...
...unfortunately, is not constant in every...

...cycle pattern in Japan is quite...
...but a dash will occur...
...the early sixties...
...in the early sixties...
...cycle...
...II...
...II...

Table VIII

Postwar Cycles in Money Supply Growth Rates in Japan

Cycles	Duration in quarters		
	Whole cycle	Upswing	Downswing
1954 III - 1958 I	14	10	4
1958 I - 1962 II	17	13	4
1962 II - 1964 IV	10	5	5
1964 IV - 1968 I	13	4	9
1968 I - 1970 IV	11	7	4

Comparing both Japanese growth rate series a parallelism between them is quite evident, with, more exactly, money supply always leading the GNP-series what is especially manifest, if one looks at the respective troughs and peaks of the rows. Only to the end of the period under consideration the interrelation loses some force. This parallelism between both series is also evident from Table VII and Table VIII, the comparison of which shows a nearly constant lag (or lead vice versa).

6. For the case of ^{the} U.K. we unfortunately have only growth series since 1956 II. Moreover, it is not GNP but gross domestic product (GDP) that was available on a quarterly basis and that is plotted as curve 9 in Chart V. What is remarkable is the relatively low average of growth rates and the obvious lack of any clear-cut cycle pattern. The series seem to reflect only a more or less erratic movement. According to our cycle criteria we can't discover any full cycle in the period which is covered by our data. There are never three or more quarters exhibiting growth rate changes in only one direction.³⁰ Nevertheless one could fix two cycles from 1959 I till 1963 I and from then on till 1966 IV, though this procedure is really quite arbitrary. Table IX lists both cycles:

in every respect. Clearly parallel ...
 the fifties and early sixties. ...
 the fifties, that starts from 1954 III ...
 and the most marked. This ...
 from 1962 II till 1964 IV. ...
 don't any ...

Table IX

Postwar Business Cycles in U.K.

Cycles	Duration in quarters		
	Whole cycle	Upswing	Downswing
1959 I - 1963 I	16	4	12
1963 I - 1966 IV	15	4	11

Money supply in ^{the} U.K. shows, contrary to the GDP-series, a clear cycle pattern as the reader can immediately see from curve 10 of Chart V. Thus, in 1952 IV we have a trough from which on an upward movement starts. The cycle as a whole comes to an end in 1958 III after nearly three years of more or less erratic swings around a growth rate of zero. The following cycle ends in 1962 II. Here, and also in the third cycle - that duers until 1967 II, we recognize a relatively short and clear upward movement followed by a downswing which exhibits - as in the first cycle - some form of intermediate peak that, however, is not marked enough to be called a true new cycle. The last cycle under consideration is more simple-shaped. It consists of three quarters upswing and six quarters downswing till the trough 1969 III, with no deviation from the main direction of movement.

Table X

Postwar Cycles in Money Supply Growth Rates in U.K.

Cycles	Duration in quarters		
	Whole cycle	Upswing	Downswing
1952 IV - 1958 III	23	8	15
1958 III - 1962 II	15	5	10
1962 II - 1967 II	20	8	12
1967 II - 1969 III	9	4	5

Table X, once more, shows that the downswings are generally longer than the upswings - up to twice the time of the former.

In the United Kingdom, as in the case of France, mere counting of cycles in both series does not lead to evidence for a parallelism between GDP and money supply. But remembering that U.K.'s money supply series starts four years in advance of GDP series, at least the first cycle of Table X can't be expected to exhibit some parallelism with the cycles of Table IX. However, cycle two and three of Table X show much coincidence with the business cycles of Table IX. This is also evident from Chart V, where we realize nearly constant leads of the money supply of one to two quarters. Only to the end of the sixties the parallelism of both series looses much of its force.

All five Charts thus reflect that business cycles and growth cycles in respective money supplies exhibit a parallel movement, a further interpretation of which will be given later.

III. - Considering the Transmission of the United States' Business Cycles

1. The description of growth rates in the countries under consideration thus far chiefly served an introductory purpose. Now we finally turn to our main task, the comparison of business cycle movements in the United States and in each of the different countries. For this purpose we have prepared Charts VI through IX containing each GNP-growth rates of the United States and of one selected country. If the business cycles of the United States spread to other countries one should expect not only a parallel movement of business cycles but also a permanent lead of the developments in the United States.

2. Chart VI shows the case of United States versus Germany. Curve 1 reflects business cycles of the United States, curve 3 those of Germany. Before engaging in the description of Chart VI let us remind ourselves of Tables I and III in Chapter II. There we realize six complete business cycles for the United States, while Germany shows only four. But, as with the money supply data above, this discrepancy is

not sufficient for an answer to our question. For if we look at Chart VI, we soon recognize that albeit the different number of postwar cycles in both countries, throughout many periods both curves exhibit clearly parallel movements.

Starting with the early fifties curve 3 succeeds curve 1 for about two to four quarters. The first American trough in 1952 III has some sort of counterpart in Germany two quarters later. The first peak of curve 1 precedes a small peak in curve 3 for one quarter. The starting point of the first German business cycle (1954 I) is actually to be found one quarter earlier than the starting point for the second American business cycle (1954 II), but the following upswing in both curves is parallel in such a manner that the hypothesis of an international transmission of business cycles seems to be firmly validated. That is also true for nearly three years to follow the double peak of 1955 III. Then, however, some trouble emerges for this hypothesis. The marked slowdown of curve 1 in 1957/58 is not duplicated by curve 3, at least not clearly enough. This also holds for the upward movement of curve 1. What is still more impressive, is a sudden trough in curve 3 during a time of uninterrupted upswing in America (1958/59). Obviously no explanation originating from a spread of the American business cycle can be found for the double peak of curve 3 in 1960/61, the last of which even runs contrary to the development of curve 1. One might suggest that the peak of curve 1 in 1962 I induced the short upswing in curve 3 one quarter later, but the development before and after this event don't encourage the support of this suggestion. As we just suggested: the development in German business cycles during the years 1963, 1964, 1965 can't be sufficiently explained by influences emanating from the United States' cycle behavior for - even if there are parallel movements - curve 3 always succeeds curve 1 if one examines the small peaks and troughs of those years - the same is true for the succeeding great trough in curve 3. The independence from the United States' influence is also clear in the case of the heaviest German business cycle downswing

1966/67. All business cycle downswings in the United States, even if they were extremely marked, up to 1965 never preceded great downswings in Germany. And even if there existed a spread of business cycles, the interrelation between the United States and Germany surely was stronger in the early fifties than it was in the second half of the sixties. So the downswing in curve 3 couldn't have been caused by the simultaneous smaller downswing in America. We won't, however, exclude the possibility that the American downswing reinforced other forces which were the prime cause of the trough in curve 3. For the years following the recovery in Germany the developments of curves 1 and 3 just run contrary to each other so that this period can't be used to validate the hypothesis that there existed a transmission of business cycles from the United States to Germany.

Our final verdict about Chart VI and the hypothesis of a transmission of business cycles from the United States to Germany runs as follows: Up to 1958 III this hypothesis can't be refuted by merely looking at the chart, for during this span of time a clearly parallel movement of both curves 1 and 3 has to be realized. Moreover, at least up to 1954 the German development lags behind the cycle movements of the United States and up to (at most) 1958 III peaks and troughs (also small ones) occur on the average at the same time.

Thereafter, however, any parallelism between both curves is at most random and provides no basis to suppose that the above hypothesis further holds.

3. Chart VII compares the United States (curve 1) with France (curve 5). From Chapter II, we know that France experienced only two clear-cut cycles³¹ and both cycles never lag the development in the United States. This hint, however, doesn't do. We need further information. For the first year, for which we have French growth rates, we could state that there is an obvious spread of business cycles from the United States to France, because the down-

ward movement in both countries is actually parallel - France succeeding with a one year's lag. But the first American upswing starting in 1952 III is not duplicated in France. And before curve 1 can reach its trough in 1954 II the French growth rates rise significantly. While, then, the United States recover till 1955 III France shows a modest decline in its growth rates. In any case, with the end of 1952 any parallelism, even with a different lag as before, vanished. Up to 1959 curves 1 and 5 move in contrary direction. The peak in curve 1 of 1962 I seems to induce a relative peak in curve 5 in 1962 III but the succeeding slowdown and heavy upswing in France can't be explained by the development of curve 1. Moreover the new peak in curve 5 leads that of curve 1 for just one quarter. The slight decrease of growth rates in the United States in 1964 III/IV surely does not cause the enormous downswing in France that stops in 1965 I. Two years of nearly parallel movement follow 1966 and 1967. The great deviations from any trend in 1968/1969 in France can't be attributed to external influences - these deviations reflect the strike of May 1968, which finally led to the abdication of General de Gaulle.

The general setting of the cycle movements in both countries leads to the suggestion that apart from very few intervals, such as 1952 and 1966 and 1967 no parallelism in business cycles of the United States and France can be realized. One could, however, think of an argument that runs as follows: Not only during 1952 but throughout the fifties and the beginning sixties up to about 1962 curve 1 obviously leads the development of curve 5 - the lead varying only between two to four quarters. A futile look at Chart VII seems to verify this argument. But we can't imagine that the upswing in curve 1 in 1954/55 of at all nearly 12 per cent causes an upswing in curve 5 of about 8 per cent (in 1955/56) whereas the two quarters upswing in curve 1 of about two per cent in 1956/57 causes an upswing in the French business cycle of about 11 per cent in 1957/58. These curious conse-

quences, however, would result from the adherence to a futile look at Chart VII. At most the third American cycle from 1958 I - 1961 I can, with some kind intention, be regarded as a pattern which becomes reproduced by curve 5 with a one-year's lag. After all, the postwar-cycle experience of France as a whole appears at best unconvincing if it is compared with that of the United States. More explicitly, the regime of fixed exchange rates during a period in which the United States were the greatest economic power of the world did not consistently lead to a spread of business cycles from the greater to the smaller country (if it did at all). The development in France thus can't be cited as evidence for the transmission-hypothesis.

4. The case of Japan which is reflected in Chart VIII seems to be more plain from the very outset than both the case of Germany and of France. While, especially for France, it was extremely difficult to realize clear cycle movements, the postwar period of Japan is quite different with respect to this problem. For there were obviously five business cycles of which the first under consideration exhibits some parallelism with business cycles in America, more exactly the second cycle of our Table I. For this cycle also holds that the development in the United States precedes the events in Japan. While the second Japanese cycle might possibly be enforced during its upswing ^{of its upswing} of curve 1, it shows by its mere duration that some other primary forces must have been at work. That is also true for the third Japanese cycle, from 1963 I - 1965 III. It starts during a time of downswing in the United States and reaches its trough just two quarters before a peak in the United States cycle development (and this peak is not a peak which terminates a short upswing as is evident from Table I). Without knowing anything about the developments before it, the fourth Japanese cycle could be thought of as merely duplicating the development of curve 1 with a lag of about two quarters.

But as its starting trough can't be explained the whole seemingly parallelism must be due to other causes. The last Japanese business cycle and the ensuing tail of curve 7 however, exhibit once more a parallel movement with regard to curve 1. We thus conclude that at the beginning and to the very end of the postwar period under consideration the business cycle pattern of Japan does not refute the transmission-hypothesis. In any case it seems advisable to reconsider both these periods - first, in order to dig a bit deeper into the transmission mechanism, and second, because the interval in the midst of those periods induces us to suppose another explanation of the business cycles that has to be checked against the cycle hypothesis for the aforementioned periods. The subsequent section will have the task to provide us with an answer for this question.

5. During the period under consideration the U.K. experienced virtually no marked business cycle movements. Ups and downs were always short and never pervasive, as for instance in Japan. We already accommodated us to these circumstances when we pointed at the arbitrariness of Table IX. On the other hand, the major country of the Free World showed at first heavy and afterwards moderate business cycles. This mere fact could be used as a means to refute the transmission hypothesis. But Chart IX which reproduces both business developments in the United States (curve 1) and in the U.K. (curve 9) does not, from the very outset, give support to the refutation of the transmission-hypothesis. At least the period from 1956 to 1962 exhibits a parallel movement of both curves, curve 9 always lagging about four quarters behind curve 1. The fourth American cycle from 1961 I to 1963 II, however, is not any longer duplicated by curve 9. And the non-parallel development in both series continues till the end of the postwar period considered. We are led to this suggestion by the fact that, while the third American cycle upswing still precedes an upswing of curve 9, nothing of this sort can be realized during the period 1962. And the upswing of the second U.K.-"cycle" in 1963 leads to a peak that lags more than two years behind the nearest preceding peak of curve 1, so that there can't be expected any

causal influence running from the United States business cycle to U.K. Since for the time following this event curve 1 and curve 9 mostly show developments at contrary direction and no reasonable lag-structure is able to suggest any further parallelism between both curves. Thus our conclusion is that possibly during the late fifties there has been some transmission at work that, however, is not any longer significant during the sixties, apart perhaps from the years 1960 and 1961.

IV. - The Working of the Transmission-Mechanism

1. Chapter II and Chapter III served a more descriptive task which was actually necessary in order to become familiar with the business cycle developments in the countries under consideration and in order to have a first check of the transmission-hypothesis. This first check couldn't find, for the greatest part of the postwar periods, a sufficient confirmation of the hypothesis that the United States' business cycle patterns dominated those of the countries that have been analysed. There are, however, a few periods for which the transmission hypothesis can't be refuted by mere inspection of Charts VI through IX. These periods now merit a special analysis - an analysis which does not confine itself to description but which also relies on theoretical findings.

The theory of adjustment of a country's balance of payments under a regime of fixed exchange rates claims that, e.g. a reserve-losing country restricts its domestic money supply in order to moderate inflation, to dampen business and thus to decrease among other things, as investment, imports from foreign countries, which contribute to the decrease of reserves. Simultaneously, the dampening effect on the home business induces exports to rise. Both developments taken together tend to correct the balance of payments deficit. A reserve-gaining country, on the other hand, is - according to the rules of the game - thought of to expand its domestic money supply. (Note the importance attached to money supply!) This will, following similar lines as in the above argument, tend to increase imports and to decrease exports and thus finally correct the imbalance.

What will be our task now, is to state explicitly the crucial points of this familiar theory with regard to the aim of our analysis. If we understand the argument correctly the transmission of the United States' business cycles runs as follows. An upswing of the American economy tends to increase American imports from foreign countries among which we find our four countries Germany, France, U.K., and Japan. For the latter this is equivalent to an increase of exports to the United States and, since the US-economy is thought of to be the dominant economy of the world, to an increase in overall exports - possibly with a lag - for other countries can also expand their businesses, other countries thus according to familiar theory finally importing more. The rise in exports in turn will lead to a gain of reserves in the exporting countries.

For the transmission-mechanism to work it is sufficient that all (here: exporting) countries have a large foreign sector and that they are themselves heavily interrelated such that business cycle developments in the United States will possibly affect all nations together. This precondition is clearly satisfied. An upswing in business in the United States thus should cause upswings in the countries mentioned via a rise in reserves and an equivalent increase in the respective amounts of money in each of the countries. Even if a business upswing is of only nominal character we can come to grips with this possibility for we used throughout series on nominal GNP.

A downswing in the United States ought to work itself through in the like manner. During the downswing American imports should decline thus reducing exports of, among others, our four countries. The latter will lose reserves which means simultaneously a decrease in the respective amounts of money and thus a dampening of prices and business developments.

What becomes evident from our formulation of the pure transmission mechanism is the implied holding of quantity theo-

retical relationships in each country and the inability of monetary authorities to lean against the wind in the sense of counteracting with success foreign influences under a régime of fixed exchange rates.

We did already see that this pure transmission mechanism didn't work always or that, at least, it did not dominate all phases in the business development of our four countries. In order to find out the reason why and by what cause the transmission of business cycles from the United States to other countries was hampered it first seems advisable to have a look at those periods for which we were able to recognize a parallel movement of business cycles between the United States and one of our countries. If the transmission works according to the above argument we ought to find empirical data to be in line with this argument.

2. Let us start again with the case of Germany. In chapter III we realized that up to 1953 III chart VI provides confirmation to the transmission hypothesis. Following our argument we have to begin with a look at the United States' imports during the period 1951 - 1958. We did this in Chart XII. One clearly recognizes from that chart K that the imports into the United States vary strictly procyclical with an amplitude which is still greater than that of the business development. Thus one condition for the transmission is satisfied.

We next look at the German exports and also at the movement of Germany's international reserves during the same period. As far as German exports are concerned we can only state a parallel movement with United States' imports upto 1953 II. For the ensuing three years no further interrelation can be seen. From mid- 1956 up to 1961 one can see - with kind intention, some new interrelationship between US-imports and German exports, the latter, however, succeeding with a lag of varying length. In sum this development can't be taken as evidence for the transmission hypothesis because the in-

terim period does not follow similar lines. 1

Whereas the first part of the transmission-argument is strictly validated by the evidence this is not longer true for the second part. United States' imports and German exports only show a clear parallel movement up to 1953 II.

A look at Chart XIII shows that the German money supply does by no means exhibit a parallel movement with the development in the exports. Moreover, the respective developments even appear to run strictly to the opposite direction in nearly every period of time.

We are thus led to the conclusion that possibly up to 1953 II a dominant influence from the United States' business cycle worked itself through to the business development in Germany. After this date no such clear evidence is available. For the greatest part of the post-war development in Germany we accordingly can't find any validation of the transmission hypothesis, at least not in her above-stated simple form.

CHART I

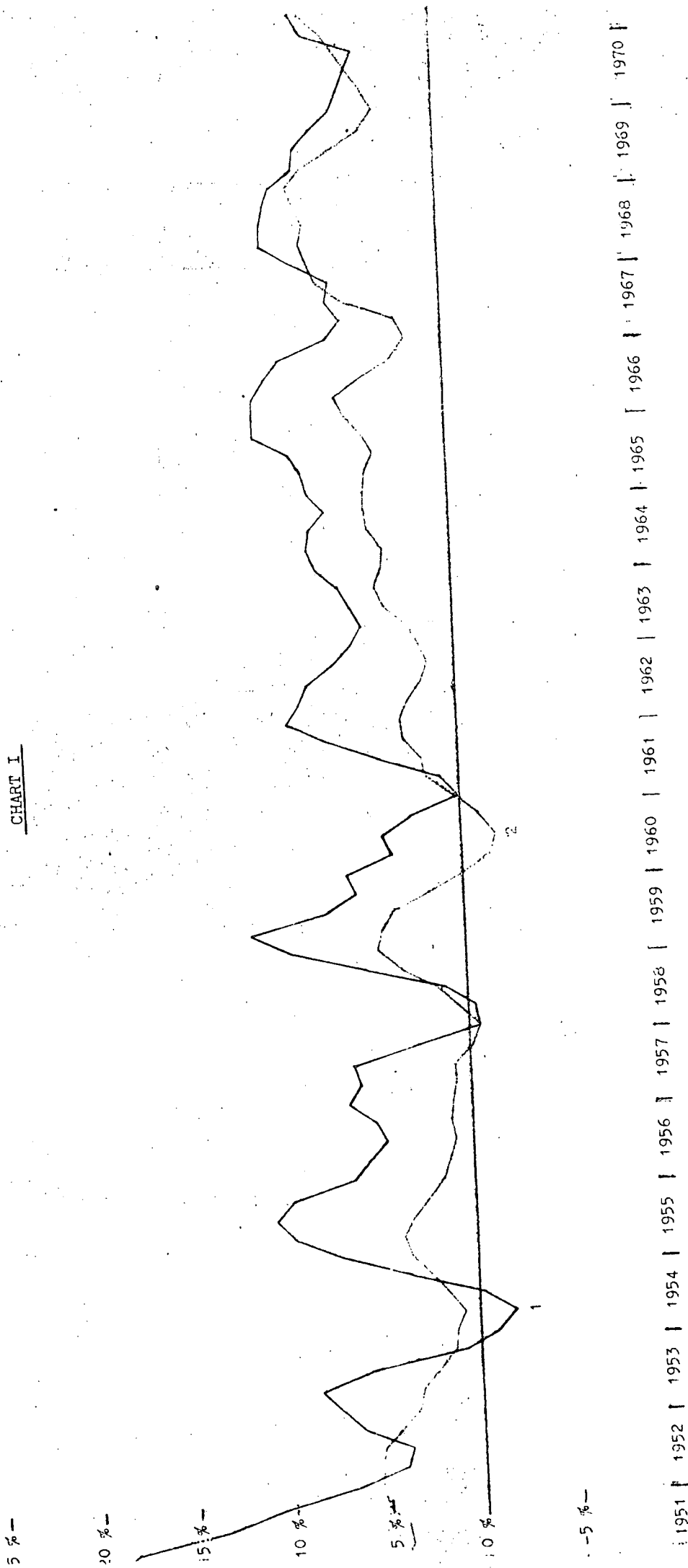
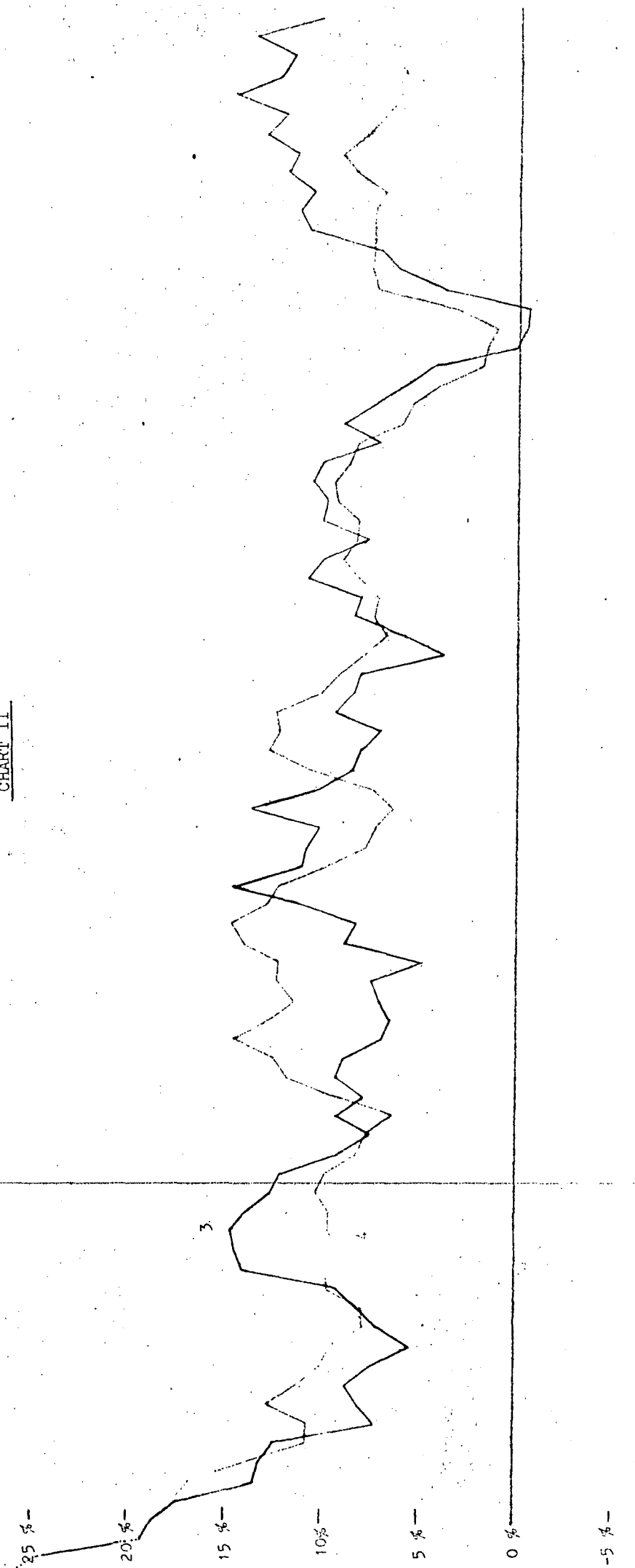


CHART II



1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 197

CHART III

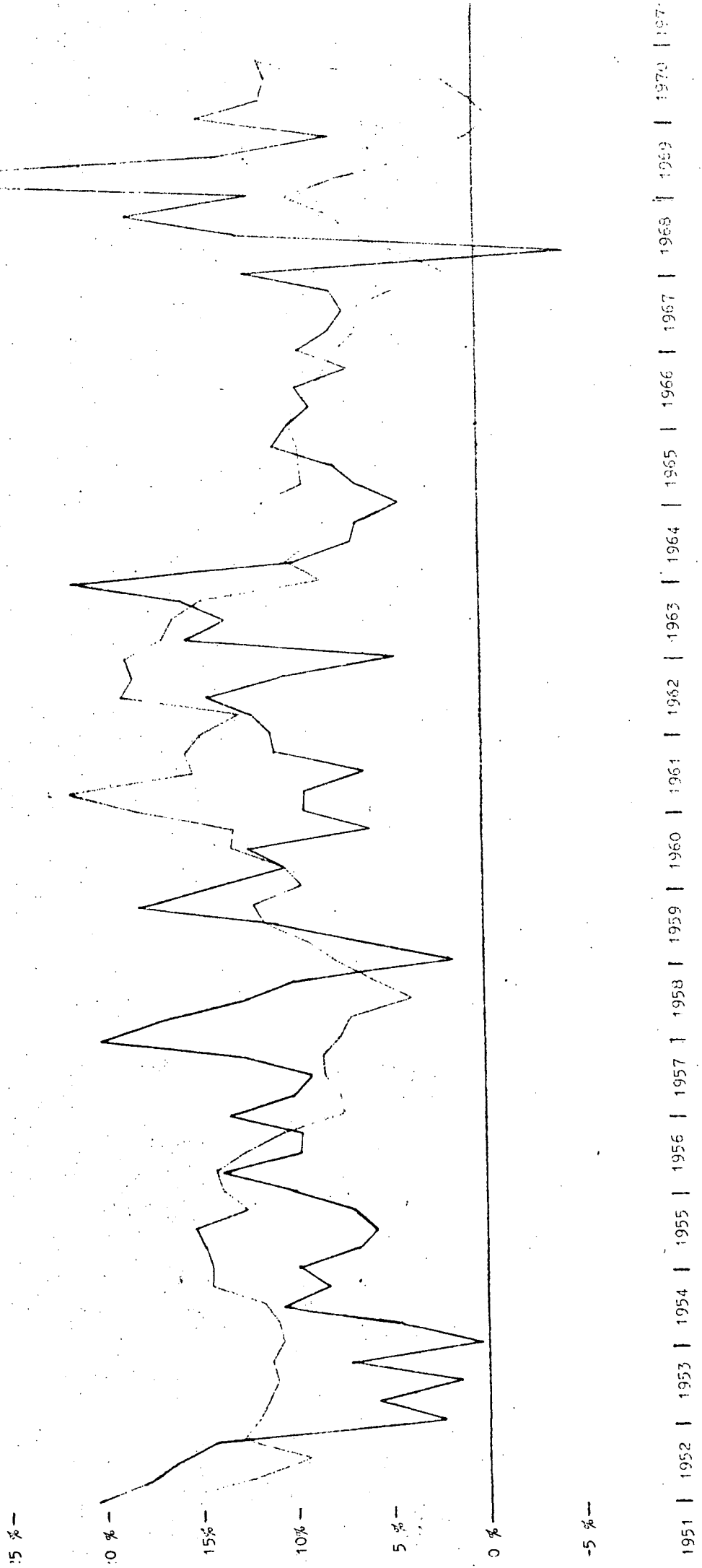


CHART IV

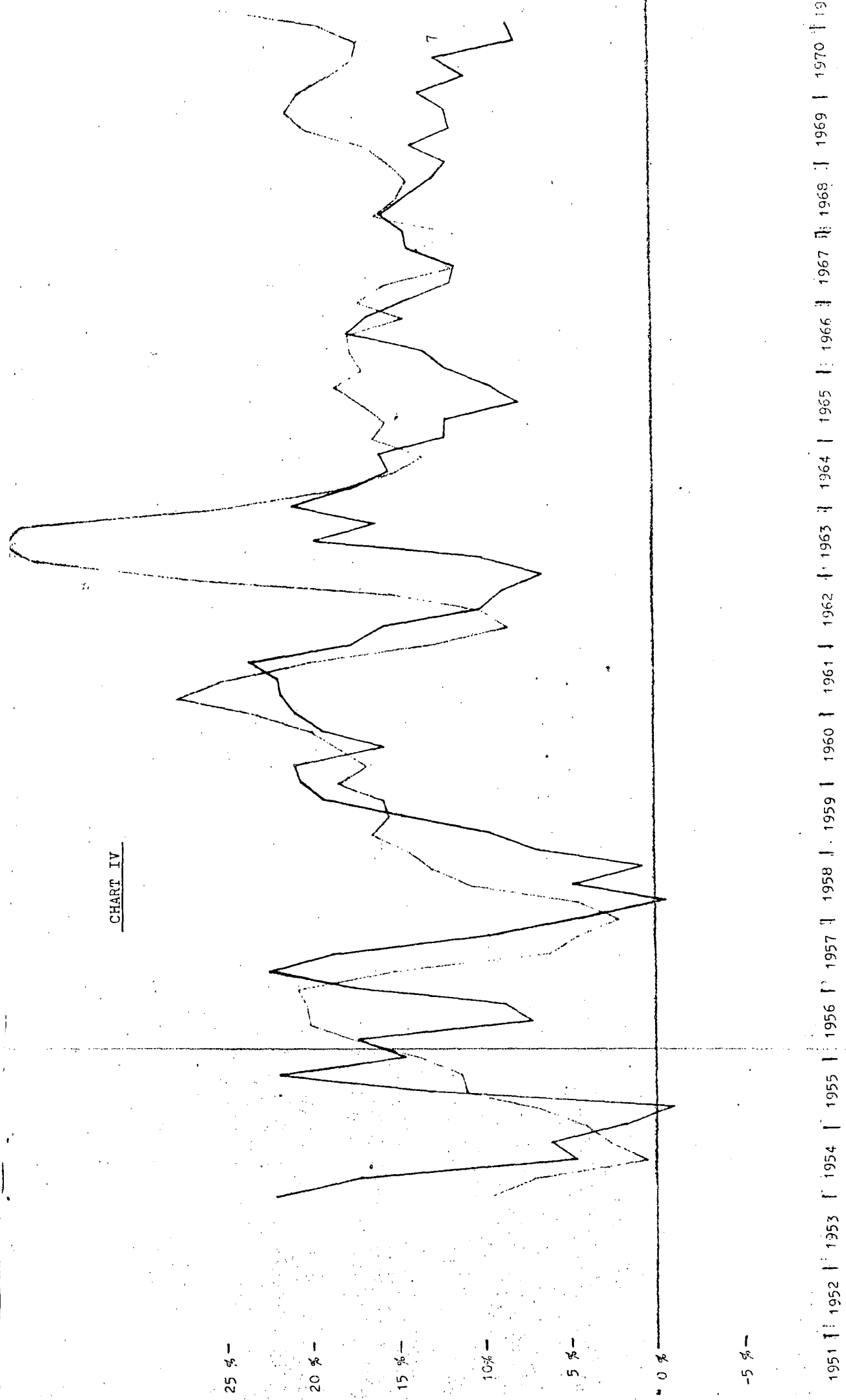


CHART V

25 %—

20 %—

15 %—

10 %—

5 %—

0 %—

-5 %—

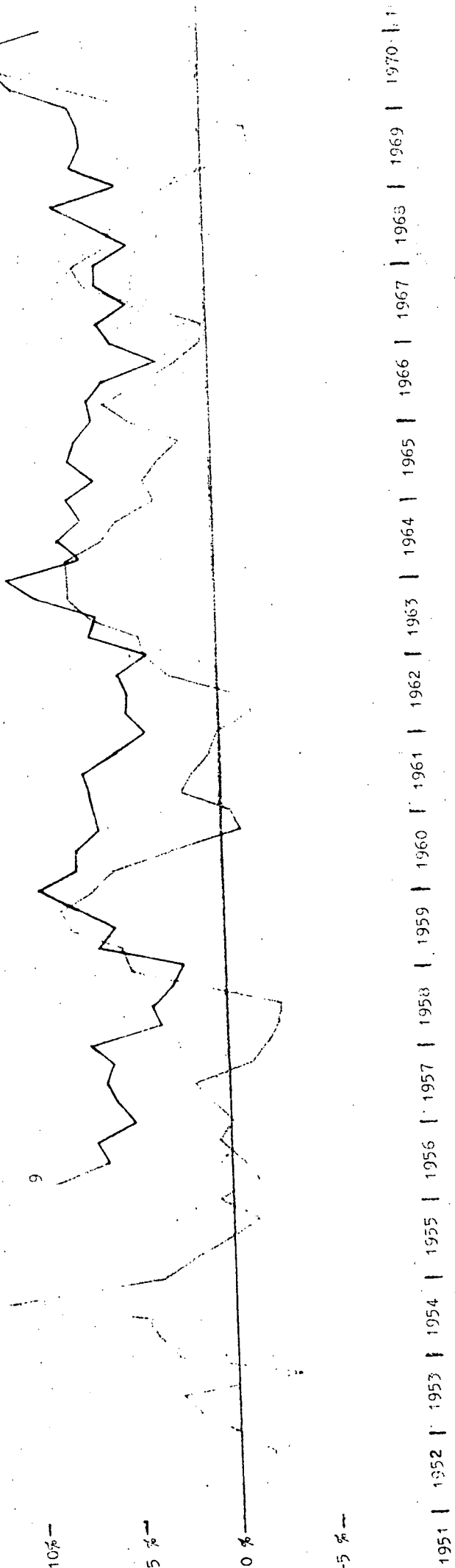


CHART VI

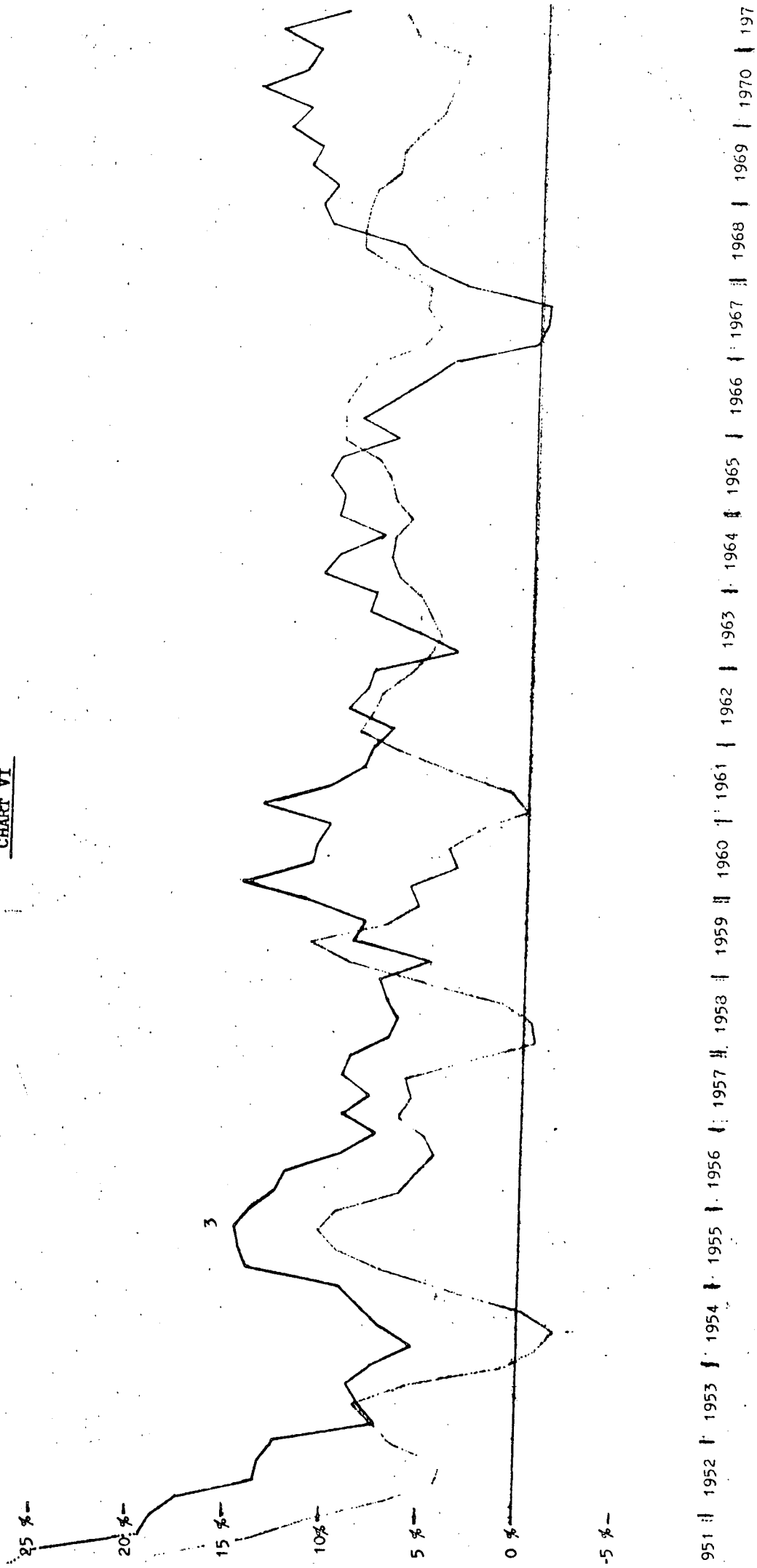


CHART VII

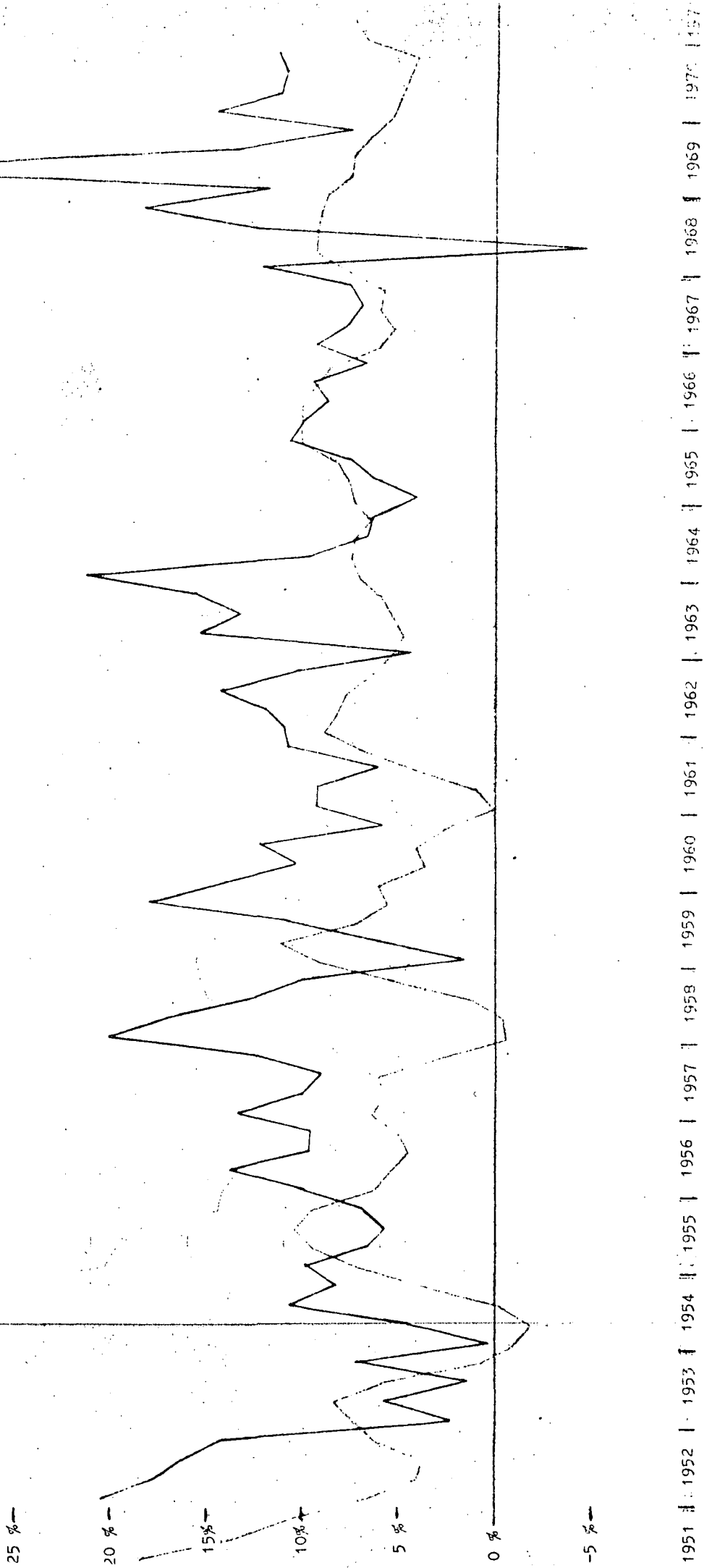


CHART VIII

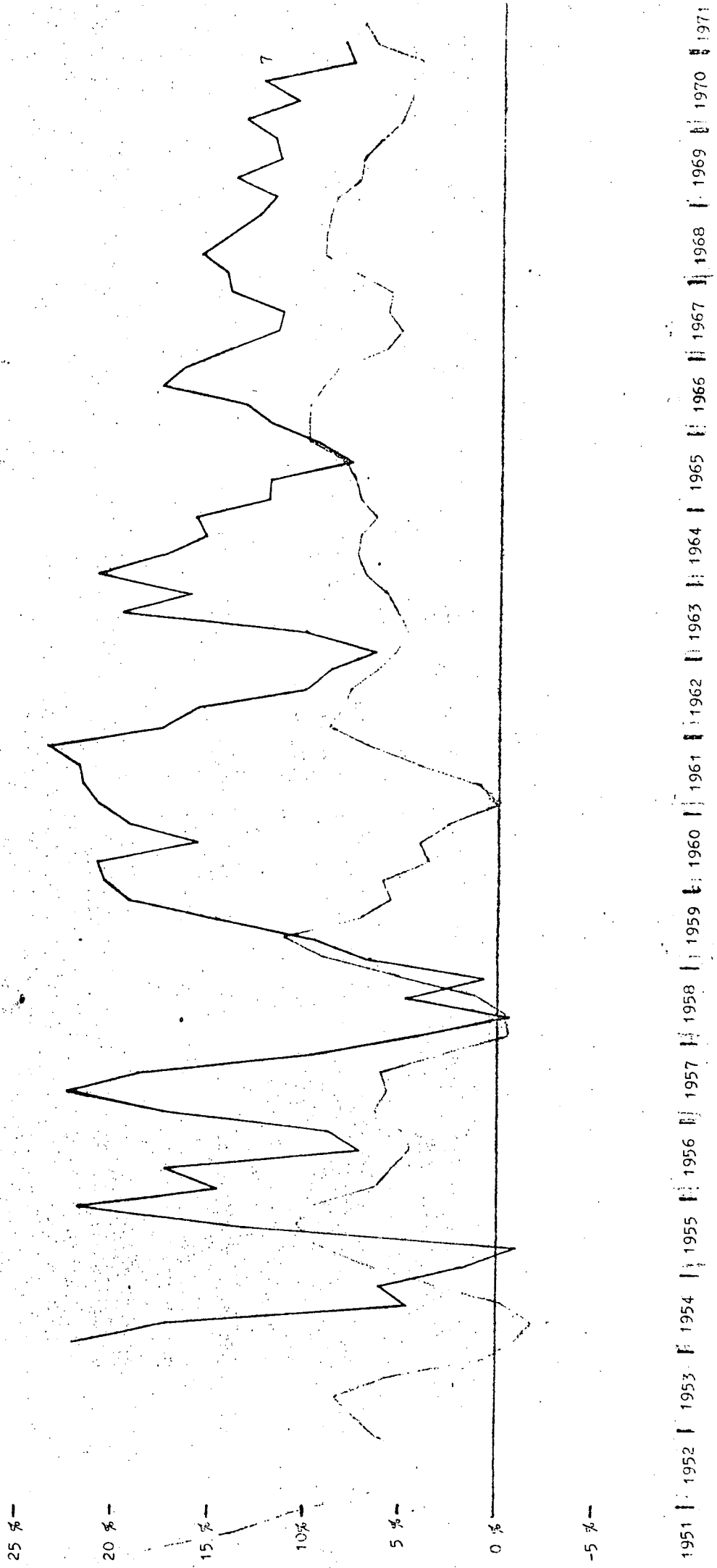


CHART IX

