

What Are Leads and Lags?

What Keynes said in 1922 about forward exchange — that there are few financial topics of equal importance which have received so little discussion or publicity — is no longer true in our days when forward exchange has an extensive and rapidly expanding literature. But the remark could be applied today with full justification to the all-important and grossly neglected subject of leads and lags. Their immense influence on trends in the foreign exchange market and on official gold and foreign exchange reserves is not realised nearly sufficiently outside the circles concerned with the operation of the system. Even economists specialising in foreign exchange or foreign trade problems usually deem it sufficient to place on record their awareness of leads and lags by devoting a perfunctory paragraph or two, or at any rate a brief footnote or two, to that vast and highly involved subject. Hardly any economist has ever attempted to analyse it adequately. The layman may be forgiven therefore for ignoring its very existence. Indeed, the role of leads and lags is not nearly as familiar to the intelligent reading public as that of other influences of comparable importance that determine foreign exchange trends — speculation, movements of foreign funds, hedging against foreign investments, interest arbitrage, or flights and repatriations of national capital.

Changes in leads and lags are of course not nearly as obvious or as easily ascertainable from published statistical material as changes in the visible trade balance, or in Government spending abroad, or in international long-term capital movements, or in the size of foreign bank balances and short-term liabilities. But that is no reason why we should not try to make the best possible use of such information on the subject as is or could be made available.

Even economists who appear to realise the importance of leads and lags as a major cause of foreign exchange crises are strangely reluctant to devote to the subject the attention it deserves. This is perhaps because leads and lags are a most exasperatingly elusive

subject. Like forward exchange or Euro-currencies, it is full of pitfalls for the theoretical expert who musters up enough courage to write about it without first taking the trouble to familiarise himself thoroughly with the practical working of the system. They may also be discouraged by the virtually complete absence of dependable statistical material indicating the magnitudes involved and changes in them. Attempts have been made to rely on balance of payment figures and to assume that discrepancies which cannot be accounted for otherwise represent overwhelmingly if not exclusively leads and lags, but such attempts have failed to produce any meaningful results.

It was only quite recently that steps were taken towards the elaboration of statistical material aimed at the measurement of leads and lags. The publication of figures by the Board of Trade on foreign trade credits are a most important step in the right direction (1). It may take some time, however, before the degree of their usefulness can be ascertained. Should they accidentally confirm expectations it would satisfy those who regard changes in trade credits as being simply synonymous with leads and lags. But it would not meet the requirements of those of us whose definitions of leads and lags are more broadly based. No attempt has been made to ascertain statistically the extent to which leads and lags assume the form of hastening or delaying purchases or sales, or the form of changes in foreign exchange covering arrangements. Even though figures are available about changes in banks' external assets and liabilities, none are available about the extent to which such changes reflect leads and lags by their customers. It must take time before the deficiencies in the available statistical material can be remedied, and it is highly doubtful whether in many respects they could ever be adequately remedied. But that is no excuse for economists to neglect the full use of factual material, even in the almost complete absence of the possibility for an acceptable and convincing statistical confirmation of their findings.

Nobody can claim really to understand the origin, development and abatement of foreign exchange crises unless he is familiar with the working of leads and lags and appreciates their importance. Even in instances in which they do not originate a foreign exchange crisis they are certain to aggravate it. Of course all major causes

(1) "International Trade Credit", *Board of Trade Journal*, July 21, 1967, pp. 160-167.

of foreign exchange crises react to each other reciprocally, so that more often than not it is impossible to ascertain with any degree of certainty which of them is the original cause that had triggered off the chain reactions, or even which is the major cause which keeps the crisis going. It stands to reason that practically the same considerations which induce speculators and hedgers from time to time to go short in sterling, and which induce foreign holders of sterling to reduce their holdings, also induce importers and exporters to engage in leads and lags.

The emergence of leads and lags as a major influence in the foreign exchange market is not a recent development. Although the term itself did not make its appearance in economic literature until some time after the last War, the practice itself must surely be very old — presumably about as old as the modern system of foreign exchange itself. But most of us failed to appreciate its full implications until its realisation came to be thrust upon us by the experience of the sterling devaluation in 1949 when, in spite of the relative unimportance of most other influences making for the persistent selling pressure on sterling, Sir Stafford Cripps was forced into devaluation by the lengthening of leads and lags. The devaluation of 1967 was also largely the result of leads and lags.

Even one of the leading specialists who has contributed a great deal towards our present knowledge on the subject, Samuel Katz, seems to think that leads and lags are a post-War phenomenon. On the basis of early post-War experience he attributed their emergence to the effect of exchange control which prevented pure speculation and movements of hot money and which diverted therefore speculative activities into the channel of leads and lags. This seems to imply that the same people, or at any rate the same types of people, who were in the habit of going long or short in foreign exchanges or shifting hot money from centre to centre before the War have resorted to the alternative way of speculating by means of leads and lags since the War (2).

In reality most of those engaged in leads and lags are essentially non-speculative types of business firms that are anxious, and at times over-anxious, to avoid taking speculative risks as far as possible. Firms of the same type had been in the habit of practising leads and lags before the War, while totally different types of firms or

(2) SAMUEL I. KATZ, *Sterling Speculation and European Convertibility*, Princeton, 1961 p. 3.

individuals had been and are still engaged in pure speculation or in shifting hot money. The assumption that leads and lags are just an alternative speculative device would imply that speculative-minded people who are now prevented by exchange control from finding an outlet for their urge to speculate have now become merchants and are engaged in imports or exports solely for the purpose of being able to circumvent the exchange control in a legitimate way by speculating by means of leads and lags.

The fact that leads and lags play an important part in the foreign exchange markets even in countries such as the United States which do not restrict speculation in exchanges conclusively proves that leads and lags are not mere by-products of exchange control. Quite the contrary. Certain types of exchange restrictions actually limit the operation of leads and lags, inasmuch as they prevent the granting of foreign credits, or borrowing in terms of foreign currencies by residents, or they limit the maximum length of trade credits to foreign importers and the maximum length of forward covering, or they fix a time limit for the surrender of export proceeds. Anticipation of the adoption or reinforcement of exchange controls in such a sense does tend to encourage leads and lags, but once the rules are established and are not expected to be changed they are likely to hinder leads and lags instead of stimulating them.

The first step towards analysing leads and lags is to make up our minds about their definition. This is all the more essential as our conclusion about their importance must necessarily depend very largely on whether we accept a broad definition or a narrow definition. Most authors writing about leads and lags have not defined explicitly what they mean by them and their meaning is simply implied by the range of the practices which they include under that head. These practices may be listed as follows:

- 1) Changes in the timing of imports and exports.
- 2) Changes in the timing of payments for imports and in the receipt of payments, or in the surrender of the proceeds, for exports.
- 3) Changes in the choice of the country or currency in which imports and exports are financed.
- 4) Changes in the arrangements for covering the exchange risk on imports or exports.

Any of the above changes are liable to be made by importers and exporters as a result of their expectation of changes in the

exchange rates. This is what concerns us primarily when dealing with leads and lags. But such changes are also liable to be made as a result of changes in interest differentials, or in the availability of credit, or in expectations of exchange controls, to mention only these. From the point of view of the effects of changes in leads and lags on the balance of payments, or on the official reserves, or on the foreign exchange market, it makes no difference why the changes have come about. Nevertheless, for the purpose of the present article we propose to confine ourselves to changes in leads and lags resulting from expectations of changes in parities, primarily from expectations of a devaluation.

Such expectations are liable to affect not only the payments arrangements or covering arrangements made by importers or exporters, but also the timing of the imports or exports themselves. Expert opinion is divided on whether such changes should come under the heading of leads and lags, even though the effect on the balance of payments, on the reserves and on the foreign exchanges is exactly the same as if the changes were made not in the timing of actual imports and exports but in the timing of the payments involved. Those who share this view include Machlup who regards "the postponement or advancing of orders by buyers as well as the withholding or pressure-selling by sellers" as a form of leads and lags (3). The same opinion is expressed by Yeager who defines leads and lags as "changes in timing which affect not only payment but also the placement of orders" (4). In my earlier writings on the subject I took a similar line. My *Dynamic Theory of Forward Exchange* specifically refers to the putting forward of imports and the delaying of exports as one of the manifestations of leads and lags (5). The section on "Leads and Lags in Post-War Theory" in my *History of Foreign Exchange* refers to the ways in which foreign trade transactions are delayed or put forward (6). But more recently my *Textbook on Foreign Exchange* omits from its definition of leads and lags the timing of imports and exports (7).

My hesitation whether to consider changes in the timing of imports and exports as leads and lags was due to the consideration,

(3) FRITZ MACHLUP, *International Monetary Economics* (London, 1966), p. 49.

(4) LELAND B. YEAGER, *International Monetary Relations* (New York, 1966), pp. 118-9.

(5) PAUL EINZIG, *A Dynamic Theory of Forward Exchange*, 2nd ed. (London, 1967), p. 219.

(6) PAUL EINZIG, *The History of Foreign Exchange* (London, 1964), pp. 277-8.

(7) PAUL EINZIG, *A Textbook on Foreign Exchange* (London, 1966), p. 240.

shared presumably by others who exclude them from their definition, that since changes in visible trade, whether brought about by anticipating devaluation or by other reasons, are already registered in the published foreign trade figures, it would cause overlapping if we were to deal with them also under the heading of leads and lags. On further consideration, however, I have now reverted to my original definition. I feel that a theory of leads and lags which aims at being comprehensive must cover every practice by which expectation of a devaluation by importers or exporters is liable to affect the relationship between supply and demand of a currency. Under my definition leads mean that the importing country loses foreign exchange sooner, and lags mean that the exporting country gains foreign exchange later, than it would have without the change in the arrangements made by importers and by exporters. It is a matter of detail whether the change is brought about in the timing of imports and exports or in the terms or methods of payment for them.

It is true, any attempt at a statistical presentation of a leads and lags theory that is in accordance with the above definition would run into difficulties if its figures were based on balance of payments statistics. For, as already pointed out above, any change in visible trade figures, whether caused by leads and lags or by other influences, is fully recorded in the figures of visible imports and exports. But this fact provides no justification for ignoring changes in visible trade brought about by expectations of devaluation by importers and exporters when we are engaged in the examination of the importance of such expectations.

What we aim at, or ought to aim at, is ascertaining or estimating the extent to which operations by importers and exporters that affect exchange rates are liable to be influenced by their expectations of changes in parities. No statistical consideration should deflect us from the pursuit of that aim. After all, what we want to know is the extent to which a wave of pessimism concerning a currency causes that currency to depreciate, or accentuates its depreciation, as a result of its influence on the attitude of importers and exporters, as distinct from its effect on speculation, investment hedging, withdrawals of funds, flight of national capital, etc.

If during a period in which sterling is under selling pressure the trade returns show a rise in imports and a fall in exports, it is generally assumed to have been the cause, or one of the causes, of

sterling's weakness. That is accepted as axiomatic, and it is no doubt right, though it is not the whole story. The coincidence of sterling's weakness with an adverse change in the visible trade balance may be due to a large degree to the effect of an expected devaluation of sterling on the timing of imports and exports, so that the adverse trend in sterling is both the cause and the effect of the adverse trade balance. Unless we include the timing of imports under our definition of leads and lags this important conclusion is apt to be overlooked and our explanation of trade figures might be faulty in consequence.

In any case there seems to be no logic in laying down the rule that, while changing the timing of payments for imports and exports is a matter of leads and lags, changing the timing of the imports and exports themselves is not. The statistician may well disapprove of the duplication resulting from lumping the two items together under the head of leads and lags and the combined item cannot appear in balance of payments statistics which also includes figures of visible trade. But surely it is not the economist's job to formulate his theories with the object of achieving statistical perfection. In the relationship between economics and statistics the former must be the master and the latter the servant. It is for the economist to try to provide the answer to one of the most difficult problems of foreign exchange — the extent to which leads and lags are liable to influence exchange rates. If under a narrow definition changes in the timing of foreign trade — or, for that matter, changes in the covering of exchange risk, to be dealt with later — are excluded, the problem of such changes cannot be ignored out of existence but has to be dealt with under some different heading. Yet there is every advantage in including all practices inspired by the same cause and producing identical results under the same heading.

After this lengthy but, I trust, not superfluous diversion, let us proceed with the consideration of other practices which I claim to come under leads and lags. Practically all authors writing on the subject include changes in the timing of actual payments for imports or receipts for exports. Changes in the length of trade credits constitute the main subject of the only existing substantial monograph on leads and lags, that of Bent Hansen (8). Machlup, too, stresses

(8) BENT HANSEN, *Foreign Trade Credits and Exchange Reserve - A Contribution to the Theory of International Capital Movements* (Amsterdam, 1961), p. 1.

the importance of trade credit terms and treats them as capital movements in the form of commercial credits. Alternatively, he defines leads and lags as "changes in the shipment of goods and payment for them" (9). The Radcliffe Report, which devotes three paragraphs to leads and lags, includes "movements in commercial credits" under its definition of the term (10). The Bank of England defines leads and lags as delaying or earlier payments for imports and exports as compared with the customary date (11). The reference to payments terms "customary in trade" is open, however, to criticism, because, even though broad customs prevail in some trades, in other trades terms of payment are a matter of individual arrangement between firms and changes in them depend on their respective bargaining positions. They can vary from contract to contract. The Bank of England appears to imply, no doubt unintentionally, that there are uniform changes in customary terms in each trade through leads and lags, which is not necessarily the case.

My *Dynamic Theory of Forward Exchange* deals briefly with leads and lags practised outside the foreign exchange market, in the form of postponement of payment for British goods invoiced in sterling by foreign importers, and requests by British exporters to delay payment if the goods are invoiced in foreign currencies (12). My *History of Foreign Exchange* touches upon delays in the settlement of payments arising from foreign trade transactions (13). There are several references in a similar sense in my *Textbook on Foreign Exchange* (14). Yeager's definition quoted above clearly allows for changes in the timing of payments. It may be said that this form of leads and lags is the most widely known not only among economists but also among such sections of the public as are interested in the subject.

Hansen deals extensively with the third type of leads and lags, practised by means of switching the financing of transactions arising

(9) MACHLUP, *op. cit.*, p. 155.

(10) *Report of the Committee on the Working of the Monetary System* (London, 1959), paragraphs 639, 640, 860.

(11) Bank of England *Quarterly Bulletin*. "Leads and Lags in Overseas Trade", March 1961, p. 18. Although this article was written some years ago even today it is the most valuable source of information on the practices of leads and lags. The dogmatism of its definition does not prevent its authors from dealing also with practices that are outside their definition.

(12) EINZIG, *Dynamic Theory*, p. 96.

(13) EINZIG, *History*, p. 278.

(14) EINZIG, *Textbook*, pp. 95, 130, 240.

from foreign trade from one country to another or from one currency to another. He pays special attention to the choice between discounting the bills financing foreign trade locally or in a foreign centre, a choice influenced by the difference between discount rates in the two centres and forward rates (15). The same subject is dealt with by Spraos (16). Both economists appear to be under the impression that the choice is determined exclusively, or almost exclusively, by considerations of costs, and that rational merchants always necessarily decide in favour of financing their trade in the currency or in the centre where the financing of it is fractionally cheaper. This is not so, however, in a large proportion of instances. The choice is very often influenced by totally different considerations — by preference to have assets or liabilities in certain currencies, by exchange control that often deprives merchants of their free choice, by considerations of availability of credit in one currency or another, etc.

A question of some importance is whether leads and lags should only include the choice made by importers and exporters themselves, or whether decisions made by their local bankers whether to shift the financing of the credits granted to their clients to another centre or to another currency should also be included. If such decisions involve changes in the banks' foreign short-term assets or liabilities they are included in relevant statistics published by many countries. The situation is in this respect comparable with the one discussed above concerning changes in the timing of imports and exports which are dealt with by foreign trade figures. But while such changes are decided upon by importers and exporters themselves, the shifting of the financing of their transactions into another currency or into another country is decided upon mostly by their bankers, usually for considerations of arbitrage, so that it does not come under the heading of leads and lags.

The Bank of England's article, although dealing with effects of such changes, specifically excludes them from its very narrow definition of leads and lags which it treats as being synonymous with changes in foreign trade credit terms.

(15) HANSEN, *op. cit.*, especially Part 6.

(16) JOHN SPRAOS, "Speculation, Arbitrage and Sterling", *Economic Journal*, March 1959, pp. 7-8.

(17) Bank of England, *op. cit.*, p. 18.

Likewise, the Bank of England excludes from its definition changes in covering of imports and exports with the aid of forward exchange transactions, even though the article admits that the use of this device has the same causes and effects as changes in credit terms (18). Hansen, while dealing extensively with the influence of forward rates on decisions whether to finance foreign trade locally or abroad, seems to be concerned only with the use of this device as an alternative of leading and lagging by means of altering the length of trade credits. Like Spraos, he assumes that in the overwhelming majority of instances the choice is determined by fractional margins secured through what amounts to "trader-arbitrage" (19). Nor does Machlup cover leads and lags by means of forward exchange transactions. But my own writings, especially *A Dynamic Theory of Forward Exchange*, go into that aspect of the subject in greater detail than into its other aspects (20).

The Radcliffe Report is concerned with leads and lags by means of forward exchange, but only in so far as they affect the size of foreign balances of authorised foreign exchange dealers (21). The official Memoranda submitted to the Radcliffe Committee and the evidence given by official witnesses remained vague about the exact meaning of leads and lags. They convey the impression that already in the late 1950s the authorities confined their definition to changes in trade credit terms. This may account for the view expressed by Mr. Maurice Parsons in his oral evidence before the Committee, that the running down of foreign sterling balances was a more important cause of the foreign exchange crisis of 1957 than a lengthening of leads and lags (22). This view would be quite incontestable if leads and lags consisted only of changing the terms of trade credits. I am sure that if Mr. Parsons had allowed for the other three practices which, under my definition, count among leads and lags, and especially for forward operations, he would have reached a different conclusion. Under his own narrow definition he was probably right.

(18) Bank of England, *op. cit.*, p. 21.

(19) SPRAOS, *op. cit.*, p. 5. According to Spraos, a discrepancy of at least 1½ per cent induces trader arbitrage.

(20) EINZIG, *op. cit.*, pp. 26, 67, 80, 96, 219-21.

(21) Radcliffe Report, p. 235.

(22) *Committee on the Working of the Monetary System*, Minutes of Evidence, paragraph 13383.

It seems that the most highly controversial aspect of the definition of leads and lags is whether to include changes in forward exchange covering arrangements. The explanation of the disagreement on this question is twofold:

1) The Bank of England and others who exclude forward transactions from leads and lags believe that the importance of leads and lags lies in the role they play in influencing the balance of payments. Those who share my view believe that their importance lies in the role they play in influencing the foreign exchange market.

2) The Bank of England's article appears to assume that pressure through adjusting forward exchange covering arrangements in anticipation of a change in parities does not affect the balance of payments. Those who share my view believe that in given circumstances forward exchange operations affect capital items in the balance of payments through their effect on the banks' foreign short-term assets and liabilities.

To my mind leads and lags are important irrespective of whether they produce their effects through the balance of payments or outside it. Since they affect foreign exchange trends they tend to affect official reserves and, through such effects, they tend to influence many aspects of the domestic economies of the countries concerned. Even if I were to agree that forward exchange transactions resulting from leads and lags do not affect the balance of payments I would still be convinced that, since such transactions react on spot exchanges, they are as important as leads and lags that affect spot exchanges directly.

In the absence of official support to the forward rate of a devaluation-suspect currency, the counterpart to forward exchange transactions is provided in the market by spot transactions which tend to shift to the spot rate the effect of selling pressure on the forward rate. It is true, the resulting commitments are sought to be undone by a swap transaction involving the re-purchase of the spot exchanges just sold, against the sale of the forward exchange just acquired from the importer engaged in leading. But the resulting changes in the swap margins tend to give rise to interest arbitrage operations the result of which is a net difference between supply and demand of forward exchanges causing a corresponding change in the banks' short-term net assets abroad. The Radcliffe Report's

reference, quoted above, to "reduction of authorised dealers' balances resulting from forward transactions" clearly indicates that the Radcliffe Committee was aware of this effect produced by forward operations resulting from leads and lags. The Bank of England itself is of course aware of it. The process is clearly described in its article:

"If sterling is under pressure additional forward selling may further depress forward rates; as a consequence authorised dealers in foreign exchange may find difficulty, or face loss, in covering forward sales of foreign currency by forward purchases. They may then cover themselves by holding spot currency... and this would divert spot currency from the U.K. reserves" (23). Yet under its definition of leads and lags it does not consider that such losses originate through leads and lags, even though the article admits the effect of forward exchange operations on the balance of payments represented by "a rise in the spot holdings of foreign currency in the hands of authorised dealers" (24). Surely changes in foreign bank balances constitute a capital item in the balance of payments.

Admittedly, to the extent to which a selling pressure due to the combined effect of increase of forward buying by importers and a decline of forward selling by exporters is met through official selling of forward exchanges the banks' foreign balances and the official reserves remain unaffected. But the authorities intervene precisely because the selling pressure on the forward exchange, if allowed to proceed, would translate itself into a selling pressure on the spot exchange through outward arbitrage. So even if official intervention prevents leads and lags through forward exchange operations from affecting the size of bank balances abroad, it does give rise to selling pressure on the spot rate which, in the absence of neutralising operations by the authorities, would affect reserves.

In any case, the authorities do not as a rule hold the rates rigidly in face of such pressure which is usually allowed to produce its effect on the rates to a small extent. On the other hand, official forward exchange operations do not affect the published figures of official reserves. All that happens is that forward purchases by the

(23) Bank of England, *op. cit.*, p. 19.

(24) Bank of England, *op. cit.*, p. 19.

bankers of importers engaged in lagging cause an increase of official short positions.

However, even if we were to admit that the effect of leads and lags through forward operations on the foreign exchange market does not matter so long as it does not lead to a decline in the published official reserves or a change in the balance of payments, it would not mean admission that such effect never reduces the reserves or affects the balance of payments. This would be the case if the authorities provided all the time the counterpart to the increased demand of forward exchanges by importers. But that is far from being so. Even under the policy of virtually unlimited support to forward sterling adopted by the authorities in November 1964, they seldom aim at pegging the forward rates and meeting all the market's requirements at a fixed rate. Very often in face of selling pressure they keep out of the market and allow forward sterling to depreciate to a level at which demand for forward dollars finds its natural counterpart, thereby causing a change in bank balances abroad. Even on days when the authorities find it necessary to support forward sterling heavily, they stay out of the market from time to time. Whenever a natural counterpart is forthcoming it affects the amount of bank balances abroad.

In any case, intervention is confined to forward dollars so that, in so far as importers practice leads through forward exchange operations in other currencies, the counterpart has to be found by their bankers through the operation of the normal market mechanism, leading to changes in their holdings of foreign currencies other than dollars.

An excess of buying of forward exchanges in connection with leads and lags, in so far as the counterpart is not provided by official transactions, affects the size of bank balances abroad, and therefore it affects one of the balance of payments items. Even on the basis of the Bank of England's own point of view it appears that exclusion of changes in forward covering from the practices of leads and lags is therefore not justified. Indeed, it seems probable that in most situations amidst prevailing conditions forward operations constitute by far the most important method of leads and lags. For it is often very difficult or inexpedient to try to alter terms of payment to suit the one-sided convenience of importers or exporters. Nor is it always simple for merchants, or even for their bankers, to shift the financing of their trade transactions from one currency to ano-

ther. As for changing the timing of imports and exports themselves, it would be possible to produce a long list of arguments against such practice.

As already pointed out, it is a fallacy for economists to imagine that it is a matter of normal routine to shift the financing of foreign trade from one centre to another for the sake of fractional interest differentials. With the exception of trade in produce where fractional differences may matter a great deal, the average importer or exporter attaches much more importance to the availability of credit than to the exact cost of the credit. If his overdraft availability is already approaching the limit he may find it expedient to arrange his leads and lags in such a way as to avoid reaching the limit for his overdraft. In any case, even if there is a comfortable unavailed margin at the importer's disposal he is likely to prefer to keep it in reserve for unforeseen future requirements, rather than use up his facilities for the sake of leading which can be effected by a telephone call to the foreign exchange department of his bank instructing it to buy forward exchanges as a matter of routine. Most merchants prefer this to going to their bank manager cap in hand to ask him for an increase of their overdrafts.

From the above arguments the conclusion emerges that leads and lags should not be treated as a fascinating if exasperating statistical exercise but as an economic problem of major importance which calls for an answer regardless of whether that answer can be fitted into the framework of the statistical exercise. In so far as considerations of an elegant econometric presentation are in conflict with the requirements of finding the correct economic answer, it should not be difficult to decide which set of considerations should prevail.

PAUL EINZIG

London