Seasonal adjustment of the London clearing banks' deposits and advances

Seasonally adjusted figures of the clearing banks' net deposits and advances and other accounts were published in the June 1963 *Bulletin*, and covered the period 1959-63. The method of adjustment used was a version of the United States Bureau of the Census Method II—commonly known as Univac, which is a computer programme based on moving averages. The series have been continued in the *Bulletin* and in *Financial Statistics*, and were last revised in September 1964; since then the monthly estimates have been obtained by extrapolation. There are drawbacks, however, to the use of Univac in connection with the banking figures, and this note introduces a new method of adjustment which has recently been developed in the Bank to try to overcome some of these difficulties. Although the new method is believed to be an improvement on the old, it should nevertheless be emphasised that there is no perfect system of seasonal adjustment; whatever method is used can only, at best, provide a broad guide to seasonal movements, and there will always be considerable scope for error. An example of the difficulties which can occur arises in the coming financial year, when the timing of tax payments by companies will be affected by the transition to corporation tax. Seasonal adjustments, which are based essentially on past experience, take no account of changes of this kind.

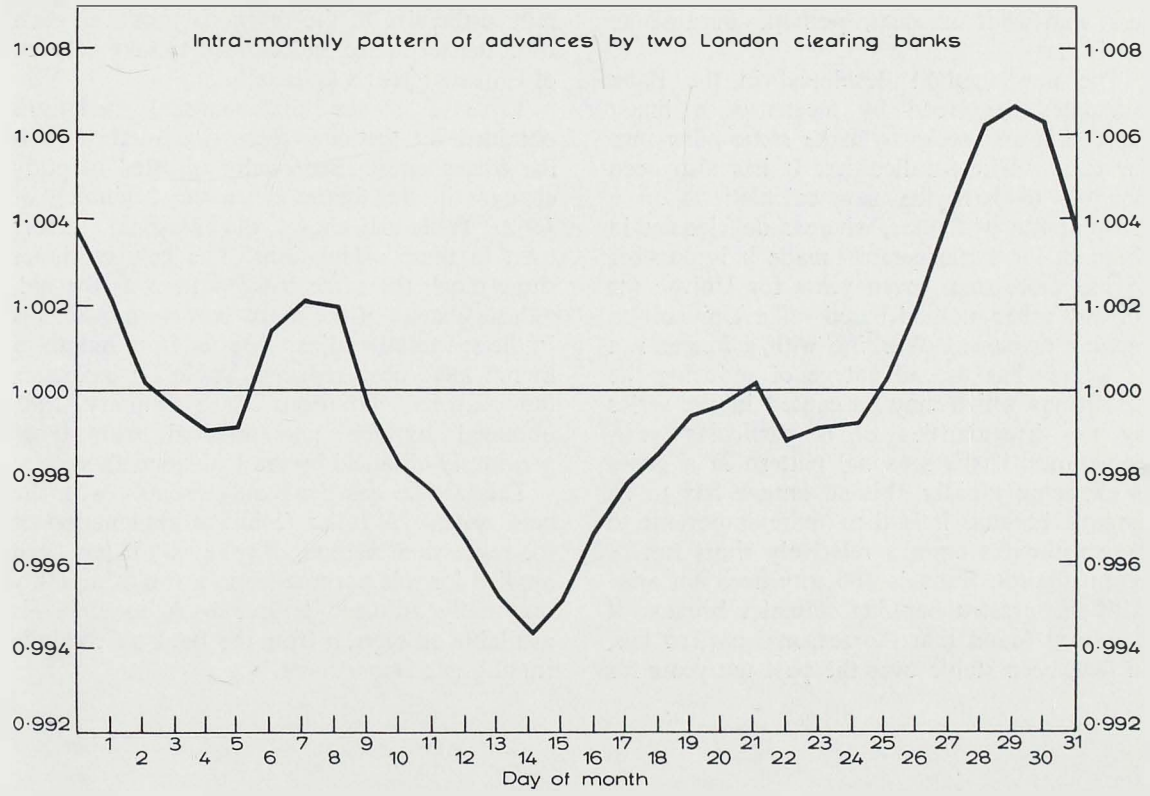
Any method of seasonal adjustment necessitates a preliminary estimate of the underlying trend, and then a calculation for each month of the deviation from the trend over a number of years. From the average of these deviations is derived the seasonal factor for that month; and the actual figures are then adjusted by this factor. For example, if the average deviation for advances in January is minus $2\frac{1}{2}\%$, the seasonal factor is 97·50, and—if there were no evidence of any change in the seasonal pattern—the level of advances each January would be multiplied by $\frac{100}{97{\cdot}50}$ to obtain the seasonally adjusted level.

The Univac method provides a good general guide to the seasonal pattern of deposits and advances. But it suffers from four important defects as applied to these banking figures.

In the first place, it takes no account of the possible effect of the variable date in the month (usually the third Wednesday) on which the clearing banks make up their balance sheets. Two of the Big Five clearing banks have kindly made available to the Bank a long run of weekly figures of advances and deposits. These show that, because there are regular patterns for these items within the calendar month, the date of make-up may significantly alter the seasonal variation. The chart opposite shows the intra-monthly pattern for advances calculated from these weekly figures, the position at each date being expressed as a deviation from the average during the whole month. Figures for the two banks have been averaged and, because of distortions in the second half of June and December resulting from the debiting of half-yearly charges, dates within these periods have—for the purpose of the chart—been omitted.

Advances tend to fall until the middle of each month and to rise thereafter. They therefore tend to be lower in any particular month as the make-up date moves from the 21st (the latest possible date) to the 15th (the earliest except, as noted later, in December); and they rise sharply when the make-up date moves

Ratio to average monthly level



on from the 15th to the 21st. The pattern for deposits is similar, though less marked.

A second difficulty is that Univac is so constructed as to give particularly heavy weighting to experience in the most recent years. And it has, in practice, tended to produce changes in the monthly seasonal pattern—especially in the latest year—which were not entirely reliable and which were subject later to considerable revision.

Univac also makes no distinction between 'banking' months, which are generally of either four or five weeks. For example, if there is an upward trend the same increase will be assumed in a four-week as in a five-week period. But this assumption would only be valid if the bulk of business contributing to the trend was concentrated away from the make-up date. This would appear to be broadly true of advances (which are concentrated towards the end of the calendar month); but for deposits the length of the month does seem to have some effect on the measurement of the underlying trend.

Finally, Univac does not allow for the incidence of bank charges at the half-year, which disturbs the normal intra-monthly pattern in June and December. Information obtained from each of the Big Five banks indicates that the effect on the aggregate figures is significant in the banking month of June in years when the make-up date falls between the 19th and the 21st; but that there is little disturbance from this cause in December, because in that month the make-up date is, by agreement, never later than the 16th. (The intra-

monthly pattern in December for advances—but not, apparently, for deposits—is nevertheless somewhat unusual, perhaps because of Christmas)

The new method developed in the Bank calculates the trend by means of a linear regression and seeks to make some allowance for these various difficulties. It has also been possible to base the new calculations on a ten-year run of figures, whereas deficiencies in the data for earlier years[1] made it impossible to use more than seven years for Univac (or for any other method based—like Univac—on moving averages). Working with a longer run of figures has the advantage of reducing the distortions which may be caused in the series by the irregularities of a particular year. Sometimes, if the seasonal pattern in a series is changing rapidly, this advantage has to be forgone because it is then more important to base estimates upon a relatively short run of recent figures. But this difficulty does not arise with the present banking statistics because it has been found that the seasonal pattern has, in fact, been stable over the past ten years for advances, and has changed only little for deposits. The longer run should also help to reduce the size of the revisions produced each time the series are recalculated to take account of a further year's figures.

Table I shows the seasonal variations obtained by the new regression method, and the corresponding seasonally adjusted monthly changes in the figures since the beginning of 1962. Table II shows the seasonal factors used in these calculations. The new estimates show much the same basic pattern as the old, although some of the more extreme movements in the seasonally adjusted series from month to month have been reduced. Table III compares the seasonal variations since January 1965 obtained by the new method with those previously obtained by the Univac method.

This article has dealt only broadly with the new system. A fuller technical explanation of the regression method and the way it has been applied for this purpose—and a run of monthly seasonally adjusted figures back to 1956—is available on request from the Bank's Economic Intelligence Department.

[1] Before 1959 the clearing banks did not make up in mid-June and mid-December, but only at the end of those months—when the figures are distorted by a number of special influences and cannot appropriately be included in a moving average.

Table I

London clearing banks' net deposits

Changes from make-up date in previous month

£ millions

	Original figures					Seasonal variations					Seasonally adjusted figures				
	1962	1963	1964	1965	1966	1962	1963	1964	1965	1966	1962	1963	1964	1965	1966
Jan. ...	+132	+ 94	+128	− 15	+ 35	+ 75	+ 80	+ 70	+ 75	+110	+ 57	+ 14	+ 58	− 90	− 75
Feb. ...	−239	−230	−247	−206	−130	−275	−280	−265	−295	−305	+ 36	+ 50	+ 18	+ 89	+175
Mar. ...	− 18	− 4	+ 15	+ 34		− 50	− 50	− 50	− 40	− 40[a]	+ 32	+ 46	+ 65	+ 74	
Apr. ...	+ 23	+ 21	+ 79	+153		+ 50	+ 60	+ 50	+ 75		− 27	− 39	+ 29	+ 78	
May ...	+ 26	+ 42	+ 20	− 9		− 20	− 20	− 5	− 25		+ 46	+ 62	+ 25	+ 16	
June ...	+114	+111	+ 35	+ 89		+ 90	+ 60	+ 55	+ 50		+ 24	+ 51	− 20	+ 39	
July ...	+ 86	+104	+191	+143		+ 80	+110	+ 95	+125		+ 6	− 6	+ 96	+ 18	
Aug. ...	− 36	+ 15	+ 50	− 18		− 65	− 50	− 40	− 70		+ 29	+ 65	+ 90	+ 52	
Sept. ...	+ 24	+ 38	+ 19	+ 31		+ 15	− 15	− 20	− 50		+ 9	+ 53	+ 39	+ 81	
Oct. ...	+ 97	+107	+154	+ 60		+ 55	+ 55	+ 50	+ 70		+ 42	+ 52	+104	− 10	
Nov. ...	− 8	+ 49	− 36	+ 23		− 20	− 20	− 25	− 25		+ 12	+ 69	− 11	+ 48	
Dec. ...	+ 90	+ 65	+ 97	+141		+ 60	+ 70	+100	+ 85		+ 30	− 5	− 3	+ 56	

London clearing banks' advances and other accounts
(excluding items in transit and advances to nationalised industries)

Changes from make-up date in previous month

£ millions

	Original figures					Seasonal variations					Seasonally adjusted figures				
	1962	1963	1964	1965	1966	1962	1963	1964	1965	1966	1962	1963	1964	1965	1966
Jan. ...	+ 30	+ 45	+ 39	− 31	+ 43	—	—	+ 5	− 30	− 10	+ 30	+ 45	+ 34	− 1	+ 53
Feb. ...	+ 93	+165	+155	+ 95	+163	+ 95	+105	+130	+100	+100	− 2	+ 60	+ 25	− 5	+ 63
Mar. ...	+ 46	+117	+ 57	+110		+ 60	+ 70	+ 70	+ 85	+ 85[a]	− 14	+ 47	− 13	+ 25	
Apr. ...	+ 3	+ 28	+ 7	+ 73		− 10	− 20	− 25	+ 5		+ 13	+ 48	+ 32	+ 68	
May ...	− 3	+ 42	+ 39	− 76		− 15	+ 5	+ 20	− 10		+ 12	+ 37	+ 19	− 66	
June ...	+ 54	+ 20	+ 31	− 9		+ 45	—	− 20	− 40		+ 9	+ 20	+ 51	+ 31	
July ...	+ 46	+ 62	+101	+ 82		− 15	+ 10	+ 20	+ 65		+ 61	+ 52	+ 81	+ 17	
Aug. ...	− 9	+ 8	+ 27	− 54		− 60	− 45	− 35	− 70		+ 51	+ 53	+ 62	+ 16	
Sept. ...	− 28	− 43	+ 6	− 59		− 20	− 50	− 70	− 75		− 8	+ 7	+ 76	+ 16	
Oct. ...	+ 41	− 2	+ 63	− 30		− 25	− 25	—	+ 10		+ 66	+ 23	+ 63	− 40	
Nov. ...	+ 12	+ 14	+ 31	− 24		− 25	− 20	− 50	− 60		+ 37	+ 34	+ 81	+ 36	
Dec. ...	+ 10	+ 5	+ 11	− 29		− 40	− 55	+ 10	− 5		+ 50	+ 60	+ 1	− 24	

[a] Estimated.

Table II

Monthly seasonal factors[a]

	Net deposits					Advances and other accounts (excluding items in transit and advances to nationalised industries)				
	1962	1963	1964	1965	1966	1962	1963	1964	1965	1966
Jan.	102·64	102·56	102·23	102·42	102·40	97·27	97·13	96·97	97·57	97·57
Feb.	98·69	98·72	98·75	98·73	98·80	100·12	100·12	100·12	99·82	99·70
Mar.	97·95	98·06	98·13	98·24	98·27	101·97	101·97	101·82	101·69	101·51
Apr.	98·69	98·86	98·76	99·15		101·59	101·45	101·14	101·75	
May	98·40	98·58	98·72	98·89		101·13	101·61	101·61	101·61	
June	99·66	99·39	99·44	99·47		102·47	101·58	101·10	100·74	
July	100·79	100·85	100·67	100·98		101·97	101·84	101·53	102·15	
Aug.	99·89	100·16	100·15	100·12		100·12	100·72	100·72	100·58	
Sept.	100·11	99·99	99·90	99·56		99·56	99·39	99·09	98·92	
Oct.	100·88	100·70	100·52	100·39		98·84	98·70	99·13	99·13	
Nov.	100·63	100·41	100·23	100·08		98·18	98·18	98·02	97·89	
Dec.	101·49	101·31	101·46	101·06		97·01	96·84	98·26	97·77	

[a] The seasonally adjusted level of net deposits or advances each month [see Table 9 (i) of the statistical annex] is obtained by multiplying the actual amount outstanding at the make-up date by 100 and dividing by the appropriate seasonal factor.

Table III

Monthly seasonal variations[a]

£ millions

	Net deposits		Advances and other accounts	
	Univac	Regression method	Univac	Regression method
1965 Jan.	+ 85	+ 75	+ 15	− 30
Feb.	−280	−295	+130	+100
Mar.	− 35	− 40	+ 65	+ 85
Apr.	+ 10	+ 75	− 15	+ 5
May	− 5	− 25	—	− 10
June	+ 65	+ 50	− 10	− 40
July	+ 80	+125	+ 50	+ 65
Aug.	− 25	− 70	− 40	− 70
Sept.	− 10	− 50	− 95	− 75
Oct.	+ 75	+ 70	− 40	+ 10
Nov.	− 25	− 25	− 40	− 60
Dec.	+ 70	+ 85	− 25	− 5
1966 Jan.	+ 95	+110	+ 15	− 10
Feb.	−310	−305	+145	+100
Mar.[b]	− 25	− 40	+ 55	+ 85

[a] Apart from any discrepancy which may arise from rounding, the sum of the monthly seasonal variations over a year cannot be expected to add up to zero with the new regression method, because of the allowance made for the variable make-up date. For advances the discrepancy should be less than 10 when there is only a difference of one day in the make-up date (for example, the year from 16th March 1966 to 15th March 1967), but may be as much as 30 when the make-up date moves forward from the 15th to the 20th or the 21st (for example, 15th March 1967 to 20th March 1968). For deposits the discrepancies should be smaller because the variable make-up date is of less importance.

[b] Estimated.