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Cash management, treating cash as an asset which itself should earn money, is not new but it has not been developed as fully as it might be by many companies. Here are some guidelines to—

CASH MANAGEMENT: FORECASTING FOR PROFIT

by Paul J. Beehler

Bank of America

CASH, the most liquid of company assets, is often also its most current liability. While this paradox may seem alien to many corporate treasurers and controllers, the truth contained in it is becoming more obvious each year. The expense of borrowing funds has fluctuated extensively since the end of World War II. This has resulted in the development of active cash management programs by many large corporations. For example, General Electric currently operates with the same cash balances it had in 1946 even though sales have grown six-fold.¹ Other major firms

such as Standard Oil of California and Samsonite Corporation have maintained cash balances nearly level for five years even though their business has expanded significantly.²

New view of cash

Although cash has traditionally been viewed as an operational necessity and as a cushion for unexpected demands on the firm's resources, new thinking in the area of cash management defines it as an asset like other properties of the company, an asset upon which a

reasonable return should be realized. The purpose of this article is to discuss the use of forecasting and cash management, not from the traditional posture of meeting current operating requirements, but rather as an asset on which a reasonable return should be earned.

Traditional cash management

Cash forecasting has traditionally served the prime purpose of providing funds for operation. As such, two major accounting-oriented approaches have usually been utilized to determine required operating cash:

- Source and application of funds technique, also called the adjusted net income method, attempts

1—Jones, Reginald, "Face to Face with Cash Management—How One Company Does It," *Financial Executive*, September, 1969, p. 37.

2—"How Business Lives Beyond Its Means," *Business Week*, November 15, 1969, p. 72.

The author wishes to acknowledge Don H. Erbel as the source for the concepts and approach used in the forecasting model described.

Concentrating funds is important to any firm developing cash management . . .

to forecast net income, depreciation, other non-cash items, changes in working capital, and non-operating cash transactions for relatively short time periods to insure liquidity. While this method is useful for forecasting the operating cash requirements, it does not extensively aid the cash manager in determining the daily or weekly movements of cash for generating revenue.

• The receipts and disbursements method of cash forecasting examines the movement of cash-sensitive items into and out of the corporate system to estimate the cash position of the firm for a given point in time. While this method is useful for short-range forecasting, the degree of detail and time required to operate such a system may make it impractical and difficult to control.

Since both of these methods have primarily been used to forecast the operational needs of the corporation, the lost investment revenue associated with exclusive operational orientation has not traditionally been given adequate consideration. These approaches are primarily accounting-oriented rather than investment-oriented. Viewing cash as a dynamic asset which should earn a return, rather than sitting idle, makes cash analogous to inventory problems faced by many firms. In other words, there are distinct economic disadvantages



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in maintaining cash inventories which are too far below or above the actual cash demand.

Cash should be kept to the minimum level which is required to meet actual needs. An integrated cash management program today requires daily forecasting of actual cash balances on hand for the purpose of investing idle cash in securities to obtain additional income. Additionally, trends in funds outstanding must be quantified so income may be optimized through appropriate long-term commitments of idle cash. Investment policies geared toward maximum investment of these funds will optimize the profitability of the cash management program. Developing and maintaining a cash management program involves three primary decision areas:

- The financial consideration in development of the cash management program;
- The technique to be used to optimize the cash management program;
- The forecasting model used to predict cash balances.

Financial considerations

In developing a cash management program, the groundwork essential to long-term success resides in solid internal and external financial procedures including:

- Concentration of corporate funds;
- Establishing a line of credit;
- Determining use and cost of borrowed funds.

Concentration of funds

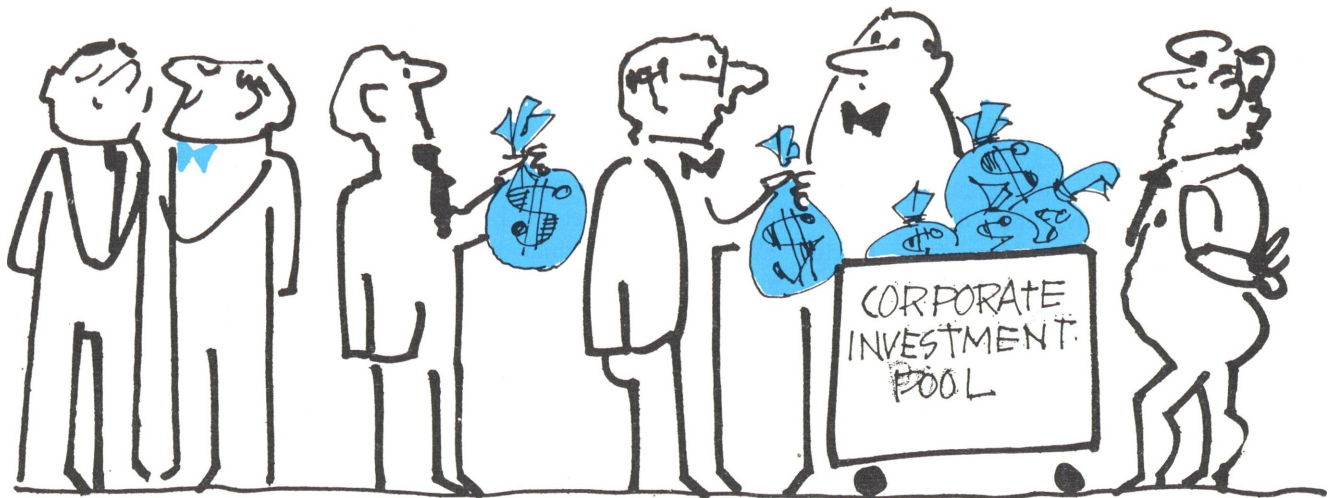
Concentration of funds is a prime objective for any firm that is interested in developing a cash management program. Since many firms

may receive funds throughout a large geographical area, centralization of these funds is necessary to:

- Provide control over total corporate cash resources;
- Centralize responsibility for management and investment of corporate funds;
- Generate cash consciousness within the corporation at all levels.

Concentration of funds can be handled through wire transfers from local banks to a central collecting bank. This mechanism is established through zero-balance checking accounts with local banks. The charges for the services will be more than offset by earnings generated on idle consolidated funds. While concentration of funds aids cash management, so does consolidation of accounts payable increase the use of corporate funds. By consolidating accounts payable, a company may control the payment of funds to gain maximum benefit from its cash resources. For example, where small or no discounts are offered for immediate payment, cash output can be delayed until the due date, thus generating income through investment of the funds which would normally be paid in advance.

Consolidation of payables will also reduce the need for operating cash on local levels. This increases the total amount of cash available for investing at any given time. For example, a small operating unit alone may not be able to profitably invest idle funds in a short-term market because of minimum investment requirements. However, when combined with other operating units, the amounts may justify investment, thereby producing income. Concentration of funds and major expenditures on the corporate level can increase the effectiveness of cash management programs



One operating unit alone may not be able to profitably invest funds; several such units by combining their funds can justify investment in a short-term situation that will earn substantial income.

by pooling resources for investment while stimulating allocation of resources from one section of the company to another as required. This reduces the total cost of borrowing and earns an appropriate return on idle cash.

Line of credit

Since cash forecasting is not an exact science, it is imperative to allow for deviations from projections. One method of providing short-term capital for the corporation while providing for overforecasting of available funds is establishment of an appropriate line of credit with the concentration bank. The cost of the line of credit is based on maintaining compensating balances and is somewhat negotiable. Generally, the cost of the line of credit is a compensating balance ranging between 10 and 20 per cent of the total line of credit.³ This means that the compensating balance on a \$10,000,000 line of credit would be \$1,500,000.

The method of calculating the compensating balance for the corporation is based on its average daily balance. This is obtained by summing the actual daily balances for the account and dividing the total by the number of days. Since

models for forecasting the actual cash balance can be expected to have a certain degree of error, the compensating balance may be covered by underforecasting the cash required to establish a reserve before investment funds are allocated. A method of including the compensating balance in the forecasting model is discussed under the example of the macro-mathematical model, later in this article.

The size of the line of credit should be based on the actual performance of the cash forecasting model employed. Observing the actual variances over a period of time will readily produce an upper limit for the required line of credit. The primary use of the line of credit under a cash management program is to provide short-term borrowing for situations where more cash was invested than was actually on hand for the investment period.

Cost of short-term borrowing

When invested funds exceed cash on hand, money would be borrowed out of a line of credit for the short-term period required. The normal interest charges on funds borrowed from a line of credit range from the prime rate to prime plus 1 per cent. If \$1,000,000 were borrowed against the line of credit for one day at 6 per cent, the cost to the corporation would be \$166.67. If the cash manager forecasts

an investment of \$15,000,000 and in fact has only \$14,000,000, the \$166.67 cost plus the loss on investing the compensating balance would be offset against the earnings on that part of the \$15,000,000 that could not have been invested without the line of credit safety factor.

The cost associated with short-term borrowing of funds for a cash management program should not be viewed as good or bad in itself; the important consideration is not how much was borrowed out of the line of credit but how often borrowing occurred. If excessive borrowing occurs, the basis of the forecasting model may require further examination to determine the reason for the high occurrence of borrowing. The point at which borrowing becomes excessive is a corporate decision involving the degree of profitability anticipated from the cash management program.

Optimizing the program

Optimization of the cash management program refers to the balance of risk and related profit a company expects to experience. This balance differs widely for each company depending upon its business goals. For example, a conservative firm may feel it is not desirable to borrow funds from a line of credit or it is desirable to keep borrowing to a minimum be-

3—"Managing Company Cash," *Studies in Business Policy* #99, *The Conference Board Record*, 1961, p. 122.

Reasonable safeguards against over- or underinvesting can be built into a model

cause it adheres to a strong cash position. Consequently, this firm must suffer lost opportunity costs in the form of underinvested funds. Conversely, an aggressive firm may experience the opposite situation. That is, by developing forecasting techniques to invest all the available funds each day, it will probably overestimate the investable funds. The resulting costs of borrowing are an expense of optimizing for the aggressive firm. A company requiring a strong cash position must accept a level of income from a cash management program which is related to its managerial philosophy. Although accurate forecasting of the actual daily balances available for investing is not simple, the overriding influence on cash management optimization is the corporate philosophy on investment of funds.

The primary areas where management must provide philosophical decisions impacting the cash management program are:

- Formulation of company policy regarding overdrafts;
- Defining the maximum borrowing permitted to achieve income (either in total dollars or frequency of borrowing);
- Establishing the size of the line of credit;
- Establishing investment criteria;
- Ability and willingness to alter internal cash handling policies.

Reasonable safeguards governing over- or underinvesting can be established within a statistical model; however, the overriding consideration is the approach management wishes to pursue. The maximum amount which a corporation is willing to borrow from a financial point of view should be determined by the point at which borrowing additional funds will not generate income equal to the cost of bor-

rowed funds. In other words, the point where marginal costs of borrowing exceed the marginal revenue of investing is the point where a corporation would not borrow funds.

The size of the line of credit available to management will seriously affect the profitability of the cash management program. The line of credit effectively determines the amount of long-term funds which a firm may be able to invest on any given day. Through a line of credit a company is able to make larger dollar amounts available for long-term investment than it could without reserve financing. For example, a minimum outstanding cash balance of \$2,000,000 per day during a given month would normally reflect the total long-term dollar amount which could be invested without a line of credit. However, through a negotiated line of credit the company may be able to invest substantially greater amounts by borrowing short-term funds. For example, if the lowest balance in a company's recent history is \$2,000,000 but \$3,000,000 could be invested in long-term securities yielding 6.5 per cent, by borrowing against a line of credit two days per month at an annual rate of 6 per cent, it is economical to incur the borrowing expense. The cost of borrowing \$1,000,000 for two days a month at 6 per cent annual rate is approximately \$333.34. This is offset by the \$5,415.00 of revenue obtained from the \$1,000,000 invested at 6.5 per cent for the entire month.

Existing banking relationships will, of course, be an overriding consideration in determining the size of the line of credit available to a corporation. In addition, management may feel a line of credit used as described is incompatible with corporate objectives. However, the larger the line of credit

available to the cash manager, the more flexible and profitable the results of the cash management program.

Management decisions on the investment criteria directly affect the risk versus profit relationship in a cash management program. Of primary importance to most corporations are these three major factors:

- Security
- Marketability of investments
- Yield.

Since the funds invested must be readily available to the corporation on a day-to-day basis with the exception of committed long-term funds, the combination of these factors is essential to a sound cash management program. Some of the securities available for investment of short- and long-range funds are:

- U.S. Treasury Bills
- Federal Agency issues
- Negotiable CD's
- Commercial paper
- Repurchase agreements.

Changing company procedures to allow for centralization of cash and payables on a daily basis is the most significant area that a dedicated management must overcome to ensure a successful cash management program. Centralization of cash requires extensive coordination between remote locations to effect daily fund transfers to a concentration point and significant retraining of corporate field personnel with regard to conservation of cash.

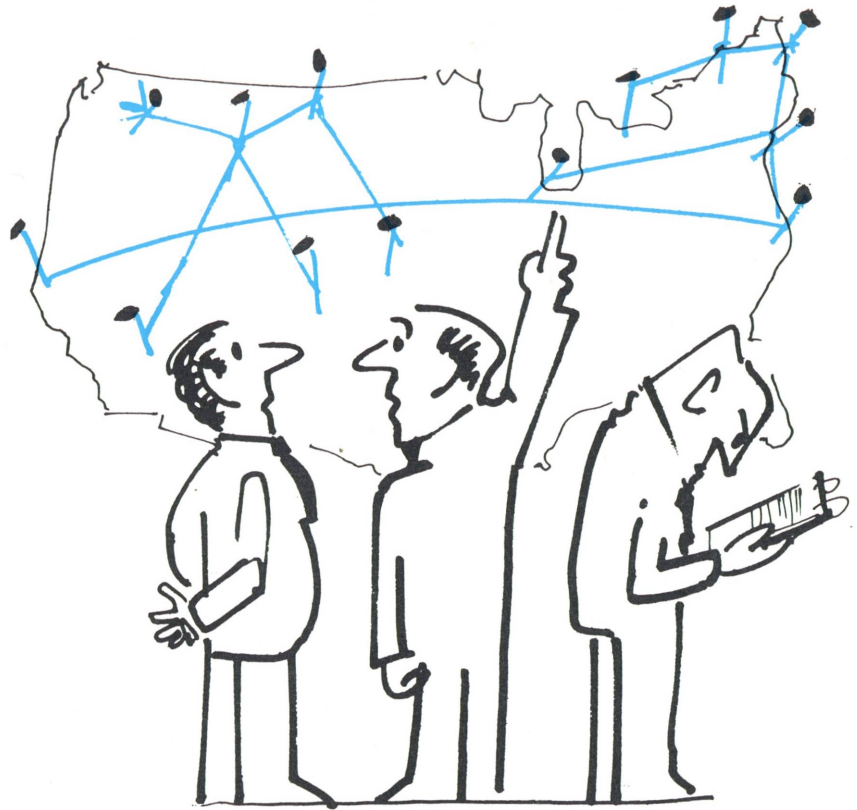
Methods of forecasting

Determining the appropriate method of cash forecasting is essential to an effective cash management program. Although the previously discussed accounting-

oriented approaches to funds flow are helpful, they must be evaluated in relation to the required time span for forecasting. For example, a quarterly funds flow analysis is useless to a dynamic cash manager. The information required is the daily cash balance needed to cover obligations which are coming due. Knowledge of the projected cash requirements for a quarter is necessary to mobilize resources for major short-term planning. However, it is almost useless in projecting the actual daily fluctuations of cash which can be profitably invested. Cash forecasting techniques which overcome this problem can generally be classified as micro models and macro-mathematical models.

Micro models

A micro-cash forecasting model is developed from the lowest level of business activity and forecasts the outstanding cash balance for the next day or period. The purpose of this model is to generate estimates of future cash balances as accurately as possible based on the activity of all cash related accounts within the company. All cash inputs and outputs through the corporate system are monitored and accounted for by the close of the working period. Some significant problems arise in the development of micro-forecasting models. The degree and number of problems vary extensively depending upon the size and centralization of the company involved. For example, most large companies with many geographically dispersed affiliates would experience difficulty tracing each cash transaction for receivables and payables through the corporation on any given day. While the use of data processing can be useful in this area, it would require significant programming efforts to support a workable system to accurately trace and monitor



Most large companies with geographically dispersed affiliates would have trouble tracing each cash transaction for receivables and payables through the corporation on any given day.

cash movements. Although many companies favor this forecasting technique, many find this approach economically impractical. Disruption of existing corporate procedures at the lowest operating level and increased clerical and administrative expenses may create operational problems disproportionate to the realized benefits. Many of these problems can be avoided through development of a macro-mathematical forecasting model.

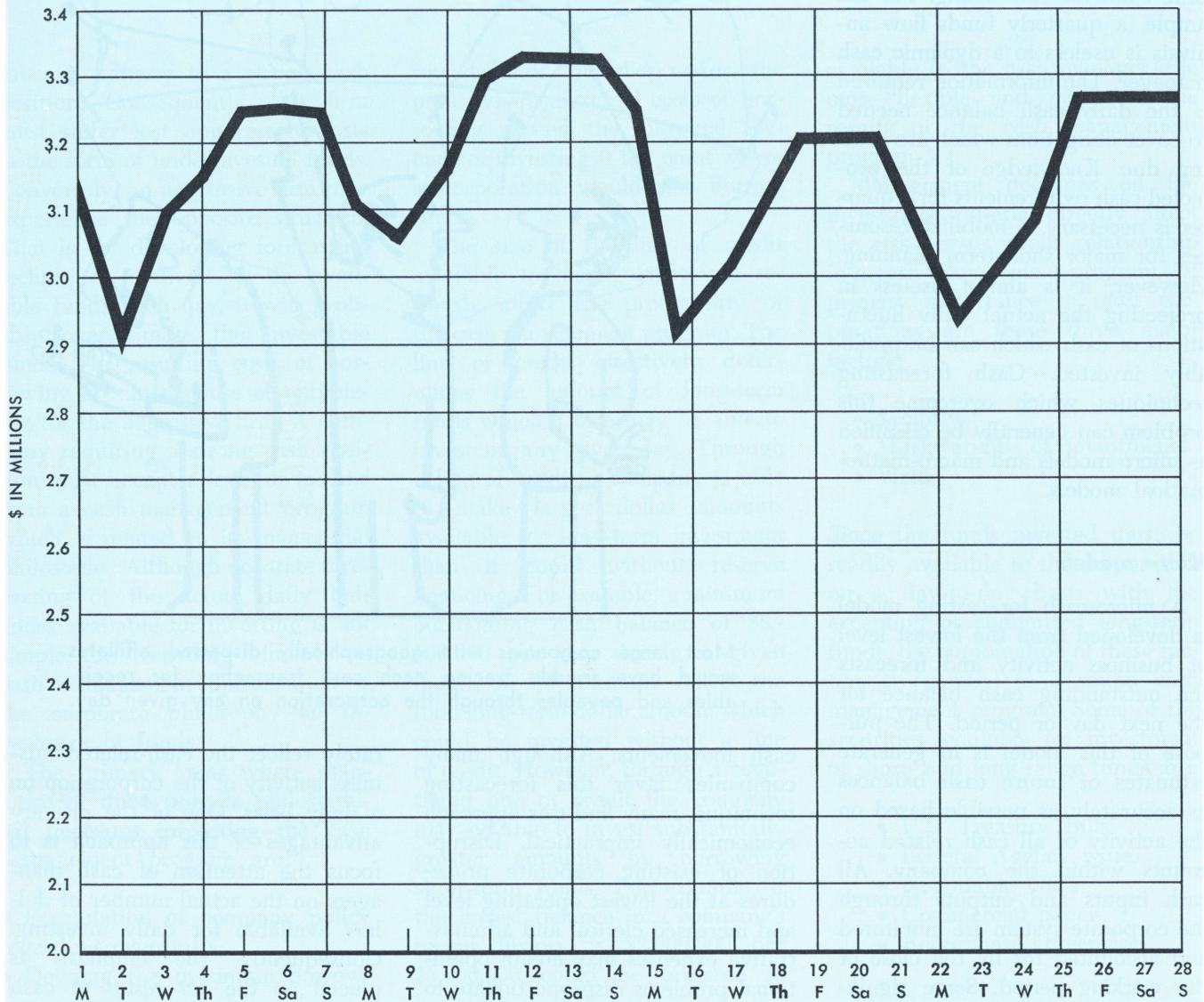
Macro-mathematical models

A macro-mathematical model is one which statistically forecasts the total number of dollars available for corporate investment. Fluctuations of individual accounts such as cash receipts or cash disbursements are not taken into account on a daily basis but rather forecast on average daily balances adjusted for recent past experience and modified to conform to corporate policies. The purpose of the macro-mathematical model is to develop a set of statistics that will accu-

rately reflect the cash-related business activity of the corporation on a daily basis. One of the primary advantages of this approach is to focus the attention of cash managers on the actual number of dollars available for daily investing. Consequently, the emphasis is placed on the *net result* of cash receipts and disbursements through the corporation. Another advantage of developing a macro-mathematical model is that it may be programmed and simulated to achieve optimum forecasting levels within constraints established by management. Assumptions regarding the investment level and established corporate policies can be entered into the system to modify the financial projections. There are three major problems associated with the development of macro-mathematical models:

- Achieving management acceptance
- Developing the internal technical expertise to develop and implement the model

EXHIBIT I
HISTORICAL CASH BALANCES



- Selecting an effective method for the company to produce reliable results for the forecast period.

The scope of the problems related to developing macro-mathematical models varies from company to company. However, in relation to the extensive work required to develop micro models, the mathematical approach offers a fast and relatively efficient way of initiating a cash management program. Safeguards may be incorporated into macro-mathematical models to provide adaptation to changing trends and conditions within the corporate environment. The degree of model responsiveness can be controlled

within constraints established by the cash manager. The use of the macro-mathematical model is recommended as a starting point in developing an integrated cash management program. Depending on management philosophy and corporate constraints placed on the cash management program, the macro-mathematical model may optimize the performance of the cash management function.

Developing a model

While there are several approaches available for developing macro-mathematical cash forecasting models, the example discussed

in this article is simple yet effective.

Having resolved the broad framework of corporate philosophy related to cash management, the steps in developing the model may be specified as:

- Graphically portraying historical cash balances
- Identifying repetitive patterns
- Determining the desired degree of model adaptability and confidence
 - Defining the optimum long-term investment amount.

The purpose of graphically plotting historical cash balances is to iden-

EXHIBIT 2

DAILY CASH FORECASTING WORKSHEET All Figures in Thousands

Date	Actual Cash Balance	Seasonal Index	Deseasonalized Actual Cash Balance	Average Actual Cash Balance	Change In Average Actual Cash Balance	Trend	Deseasonalized Forecast	Seasonalized Forecast	Forecast Error	MAD	Standard Deviation	Investment Recommendation	Net Investment Error
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
October 2	3,140	.9641	3,256	3,432 3,397	-35	-7	— 3,391	—	—	0	—	—	—
October 3	2,855	.8338	3,424	3,403	+6	-5	3,399	2,827	28	6	8	2,827	+28
October 4	3,089	.9172	3,367	3,395	-8	-6	3,390	3,118	29	11	14	3,110	-21
October 5	3,770	1.1568	3,258	3,368	-27	-10	3,360	3,922	152	39	49	3,908	-138
October 6	3,791	1.1362	3,336	3,361	-7	-9	Saturday 3,818	3,818	27	36	45	3,769	+22
October 7							Sunday 3,354						
October 8													
October 9		.9642						3,234				3,189	

tify the patterns of fluctuations which may occur. Through this approach we can visually identify daily peaks and valleys in the actual cash balances. If outstanding cash balances fluctuate in a certain pattern, consideration should be given to establishing indices to convert actual daily cash balances to a common denominator. The fluctuations may take place within a month, a week or ten-day cycle, depending upon the business environment. Exhibit 1, page 40, illustrates the graphing of actual cash balances for a selected period. In actual practice, a longer period of time, for example one or two years by day, should be plotted although a short time period is demonstrated in this exhibit. The larger the sample plotted, the more reliable the deductive results. As illustrated in Exhibit 1, a weekly fluctuation seems to occur throughout each week of the plotted data. Lower balances occur early in the week and peak on Fridays.

While the adaptability of the model will vary between companies, decisions should always reflect the managerial objectives of the cash management program. The use of an exponential smoothing factor will directly determine the adaptability of the model. Exponential smoothing is the process of applying different weights to two or more factors to develop a weighted result. In the example chosen, the

hypothesis is that 80 per cent weight should be given to historical experience and 20 per cent to current experience. In this manner, fluctuations can be identified and integrated into the model. Consequently, the model will continually adapt to dynamic conditions while giving the greatest weight to past experience.

The final step in establishing the basis for the cash management program is determining the amount of long-term investment. The basis of determining long-term vs. short-term investment can be founded on the graph developed to chart historical daily cash balances. The graph will indicate a level below which funds will not drop. This level represents the amount of long-term investment available to the corporation. As discussed earlier, this long-term investment may be increased depending upon management philosophy regarding the frequency with which a corporation will borrow to increase its long-term investment amount. For example, if borrowing five times a month would increase the amount of long-term funds invested by 20 per cent, the associated costs of borrowing should be weighed against the total revenue gained from those funds during the monthly investment period. The amount of long-term investment will significantly affect the optimization of the cash management program.

Basically, the forecasting model utilizes the average actual cash balance to project the outstanding funds for the following day. The average actual cash balance is modified to account for identifiable trends and seasonal fluctuations. To reduce the probability of overinvesting on a given day, the projected average actual cash balance is reduced by the amount of historical variance in the forecast as expressed by the standard deviation. The resulting recommended investment funds are then committed to long- and short-term revenue producing securities.

Exhibit 2, above, represents a daily worksheet for using the macro-mathematical model. The levels of long-term investment and adaptability have been defined by management. The starting weekly indices have been developed by averaging the prior ten-week actual indices by day. Consequently, the initial index for Monday is a composite of actual experience for the past ten Mondays. Since each daily index is developed in relation to its respective weekly total, the daily index average should provide a representative starting point for the model.

The actual daily cash balance, entered in Column 1, must be deseasonalized by dividing it by the weekly index to measure the deseasonalized value (Column 3) against the average actual cash

balance (Column 4). Exponential smoothing is used in developing the average actual cash balance (Column 4). The model uses 80 per cent of the previous day's average actual cash balance plus 20 per cent of the deseasonalized actual cash balance for the current day.

Since the cash balance forecast for the next day will be based on the deseasonalized average actual cash balance, changes in the balance must be examined to evaluate the trend affecting it. In order to determine the trend, we first calculate the change in the average actual cash balance (Column 5) by subtracting the current average actual cash balance from the previous day's result. The resulting positive or negative amount is used to estimate the trend affecting the average actual cash balance. The trend is developed by applying a weighted factor to our current experience. The trend line may start at zero as indicated and adapt to existing experiences. The factors may differ from one column to another to account for various degrees of flexibility desired within the model. In this example, the same weighted factors as previously used were applied in calculating the trend line. Consequently, the updated trend is 80 per cent of the trend from the previous period plus 20 per cent of the current change in the average actual cash balance (Column 5). The result (Column 6) indicates the current trend for this period. The new forecasted deseasonalized cash balance (Column 7) is simply the average actual cash balance for the current day adjusted by 80 per cent of the trend. This is the projected deseasonalized value of tomorrow's cash balances.

The deseasonalized forecast (Column 7) is then seasonalized by multiplying it by the seasonal index factor (Column 2) for the appropriate day. The new forecast corrected for seasonality becomes the projected cash balance for the following day (Column 8). Without any further adjustment, this

result could be used for short- and long-term investing for the following day. Depending upon management constraints, it may be desirable to build a margin of error into the model to account for irregular fluctuations in cash patterns and provide for required reserves to support a line of credit.

Guarding against overinvestment

The standard deviation can be used to reduce the possibility of overinvesting. For example, the chances of the *average* cash balance being correct for any given day are approximately 50 per cent. To reduce the probability that the average cash balance forecasted will exceed actual experience, standard deviations are applied to the basic average. If the seasonalized forecast (Column 8) is reduced one standard deviation, we will increase our confidence in the model from 50 per cent to 84 per cent. Consequently, we would expect the investment recommendation to be less than the actual cash balance 84 per cent of the time.

Examination of historical forecast errors is the first step in developing a standard deviation. The forecast error (Column 9) is the difference between the seasonalized forecast (Column 8) and the actual cash balance (Column 1). It is unimportant whether the forecast error itself was over or under the actual cash balance since the result will be used to develop a range value.

The mean absolute deviation (MAD) (Column 10) is updated each period to account for the degree of errors which is experienced in the model. Heavier emphasis is again placed on past experience in this model; consequently, 80 per cent of the old MAD plus 20 per cent of the new forecast error (Column 9) comprises the updated MAD.⁴ One standard deviation (Column 11) is simply 1.25 times the mean absolute deviation. In

⁴—The MAD is initiated at zero since it is based on forecast results.

the model under discussion, one standard deviation is used as the safety margin. This should provide sufficient funds to cover compensating balances for the line of credit while keeping the investment recommendation within actual cash balances. In other words, the investment recommendation for the next day (Column 12) is the seasonalized forecast (Column 8) minus one standard deviation (Column 11). As the model illustrates, the previous day's standard deviation is applied against the current seasonalized forecast (Column 8). The acceptable margin of error will vary by company depending upon the fluctuation in the actual cash balances and the risk philosophy of management. For example, if cash balances fluctuate little, perhaps only one-half or one standard deviation would be necessary to provide a safety margin. Conversely, if extreme fluctuations take place, perhaps two standard deviations are necessary to insure investment policies consistent with the corporation's goals.

The management summary

Although forecasting is critical to the cash management program, the financial manager is interested in evaluating the daily *results*. Consequently, a daily management summary is recommended. The purpose of the summary is to illustrate daily the actual performance of the model in terms of profit generated from invested funds. Exhibit 3, page 43, is an example of the daily summary resulting from the calculations of the macro-mathematical model. The projected funds (Column 2) represent the recommended investment amount. The projected balance in excess of committed long-term funds represents the short-term, or overnight, investment amount (Column 6). If the long-term funds committed are greater than the investment recommendation, no short-term investment would be possible. Consequently, funds would be borrowed against the line of credit in order

EXHIBIT 3

DAILY CASH FORECASTING Management Summary

Date	Actual Cash Balance ¹	Investment Recommendation ¹	Variance ¹	Long-Term Investment ¹	Long-Term Investment Revenue ²	Short-Term Investment ¹	Short-Term Investment Revenue ³	Gross Investment Income	OVERDRAFTS		Net Investment Income	Opportunity Cost
									Dollars ¹	Cost of Borrowing ⁴		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
October 2	3,140	—	—	—	—	—	—	—	—	—	—	—
October 3	2,855	2,827	+ 28	2,500	\$451.25	327	\$29.53	480.78	—	—	480.78	2.53
October 4	3,089	3,110	— 21	2,500	451.25	610	55.08	506.33	21	3.50	502.83	
October 5	3,770	3,908	— 138	2,500	451.25	1,408	127.14	578.39	138	23.00	555.39	
October 6	3,791	3,769	+ 22	2,500	451.25	1,269	114.49	565.74	—	—	565.74	1.99
October 7*	3,791	3,769	+ 22	2,500	451.25	1,269	114.49	565.74	—	—	565.74	1.99
October 8	3,791	3,769	+ 22	2,500	451.25	1,269	114.49	565.74	—	—	565.74	1.99
October 9		3,189		2,500	451.25	689	62.22	513.47				

* Funds invested on Friday earn for Saturday and Sunday also.

¹ Figures in thousands.

² Based on a long-term annual rate of 6.5%. The daily factor of .0001805 is applied to determine daily performance of the forecasting model.

³ An annual short-term rate (e.g., repurchase agreements) of 3.25% is used. A daily factor (.0000903) is used in order to evaluate daily performance.

⁴ The cost of borrowing used is an annual rate of 6%. The daily factor (.0001667) is used to evaluate daily performance.

to maintain our long-term investment. The amount of long-term funds invested and resulting revenue is assumed to remain constant between periods of adjustment. The daily long-term revenue is developed by multiplying the *daily* factor for the long-term rate by the amount of long-term investment. As indicated in Exhibit 3, \$2,500,000 is extended by the daily long-term rate to develop revenue of \$451.25 per day. Similarly, the short-term daily rate is applied to the varying amount of short-term funds invested to develop actual income. Funds in excess of the invested amount may be utilized to cover compensating balances for lines of credit. The overdraft dollars (Column 9) represent the overinvested funds occurring on any given day. The appropriate borrowing rate is applied to develop the cost of borrowing (Column 10) the funds from the line of credit. Net investment income (Column 11) is derived by subtracting the cost of borrowed funds from the daily gross investment income. The opportunity cost (Column 12) is based on the overnight investment rate and represents the additional income which could be earned had

the forecast been completely accurate.

The financial director utilizes the daily recap to determine:

- *The performance of the model over a period of time*—Daily analysis of the variance is easily obtained through the management summary. The cost of over-projecting is represented by the cost of overdrafts. Similarly, lost opportunity costs are reported daily.

- *Profitability of the model*—The net investment income demonstrates the daily earnings directly attributable to cash management.

- *The level of long-term investment*—The management summary can indicate the trend of outstanding funds while providing the informational base to increase the amount of long-term funds to earn higher yields.

Summary and conclusion

Although cash management is valuable as an accounting tool to meet future corporate cash needs, its primary use today is directed toward utilizing idle cash to generate additional revenue. Optimum utilization of idle cash requires a

comprehensive daily cash forecast. Before developing a cash management plan, senior financial management must define the parameters within which the program must operate. Some of the basic corporate decisions include:

- Ability to concentrate funds for investment
- Acceptable risk levels regarding type of investments
- Availability and use of lines of credit
- Management philosophy regarding the impact of long-term levels of invested funds.

While the selection of a forecasting model should be based on the investment requirements of senior management, continued evaluation of performance should be followed by corrective action to optimize results of the cash management program.

Cash should be as fully utilized as any other corporate resource to insure optimum corporate profitability. Through an adaptive cash management program, idle cash can be converted from a liability of doing business to a working asset.