



8-1973

## Cash Management and the Cash Budget

Gerald R. Smith

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CASH MANAGEMENT AND THE CASH BUDGET

By

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Bachelor of Science in Business Administration

University of North Dakota 1968

An Independent Study

Submitted to the Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

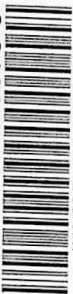
Master of Science

Grand Forks, North Dakota

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## BUDGETS

This paper is concerned primarily with cash management and the role that cash budgeting plays in the managing of cash. That discussion will be deferred until the ground work has been laid. First, several general questions should be asked and answered. Of these, let's start with what is a budget?

History tells us that budgets originated in governmental units. It was a financial document that related to anticipated revenues and planned expenditures. Its time of duration was usually a fiscal year and its purpose was a basis by which income was adjusted to outgo, or visa versa. When nongovernmental enterprises adopted the budget system, they maintained the same purpose, the control of income and outgo. The wider practice of budgeting has created a broader definition of a budget and budgeting. Budget once meant an overall plan of operations but is now used in a much broader sense. For example, one speaks of a "sales budget" or "expense budget" or of a "cash budget". However, the afore mentioned "budgets" are usually component parts of a larger budget or they are what could be called sub-budgets. One author explains a budget as "an over-all 'blueprint' of a comprehensive plan of operations and actions, expressed in financial terms". (14, p. 3) Thus, it is a financial document that outlines the future of an enterprise. Since a budget is in the future tense, estimates have to be made. The estimate is a computed guess and differs from a pure guess made at random or on the basis of general impressions. The estimate is computed on verifiable data or data that is assumed to have a high degree of probability.



An example of a guess verses an estimate could be the following. If a jar were filled with dimes, a guess could be made as to the number of dimes in the jar based on our general impressions of the size of the jar, the size of a dime and the fullness of the jar. However, an estimate of the number of dimes in the jar could be made by measuring the jar and a dime for size and weight. Then it could be computed how many dimes could possibly fit in the jar. To further refine the estimate, sample jars could be filled and the number of dimes contained be counted. This example can be transferred to business. The dimes could be sales and the jar could be one year. An estimate of sales for the coming year could be made by reviewing previous years' sales and current and past business trends. The knowledge of past and present conditions will allow a computed guess to be made. Budget preparation is making these estimates and consolidating them into a financial document. More fully, "budgeting is conceived to be the preparation of the budget and its fullest use, not only as a device for planning and coordinating, but also for control." (14, p. 4) The budget and budgeting are tools of management. As the "blueprint" of the operations, the budget can be used as the center of all business planning.

Businessmen engage in two types of planning. The first assumes that the environment for his activity will not change. The purpose of this type of planning is to enable the manager to make the most of the environment in which he finds himself. Planning within the environment is commonly called budgeting. The second major kind of planning is directed at changing the environment so that the enterprise will find itself in a more favorable position in the future. The planning for changing the environment will be ignored and only the problem of planning within the environment or budgeting will be given any attention here. used continually as a guide to

Why should a budget be prepared? Two general reasons have been proposed. The two reasons are: "1) setting standards for judging certain types of performance and control operations, 2) helping to coordinate the efforts of the many different managers and the activities within the enterprise." (16, p. 326) The magnitude of the operations of the majority of today's businesses is so vast that one person cannot direct and control all phases of a business. Therefore, the coordinated effort of several or many individuals is consolidated into the budget. Each area of the enterprise is dealt with by an individual who is informed in that area. Each individual is looking to develop the best possible segment of the business. However, these several areas must be considered together with the rest of the organization and the combined effort be planned. The budget has proved to be a useful tool in doing this. As each department prepares its budget, it can be consolidated into the over-all plan. Then an analysis of the interaction of the segments can take place. The segments may be found lacking and they may have to be reviewed. What is best for a part of the enterprise may not be the best for the whole enterprise.

Management must take an interest in the budgets that have been prepared. The budgets are the future tense accounting which is available to management to aid decision making. In an enterprise accounting ideas are used to assist and promote good management and the budget or budgets are part of these accounting ideas. "Budgeting is a way to make management more systematic." (34, p. 22) While budgeting is an instrument of control, actual control is still needed. The budget shouldn't be an annual drudgery. Is it prepared once a year and then forgotten until the next year? It should be used continually as a guide to

management. Since intelligent planning went into the budget, it can be and should be used to measure and compare actual results with planned results. An important factor in any accounting data is the feedback that it can produce. If the actual results are materially different than the expected, some investigation into the variances should take place. The reasons should be noted and corrected if possible. The budget is a coordinated effort. The variances in one area may also have significant affects on other areas.

Differences between expectations and results could have several causes. One cause could be that the forecast on which the decision was based was in error. This could mean that the knowledge on which the decision was made was either incomplete or incorrect. In either case, a cost-benefit relationship between the cost of the error and the cost of finding out the correct or complete information must be considered. If the cost of finding all the information to make the plans is very great, then something less than total knowledge will have to do for planning purposes. A second cause of budget variances could be that those responsible for carrying out the decisions have somehow failed to do what was expected. This becomes a personnel problem. The enterprise may have staff that is either unwilling to do as directed, not sufficiently trained or just unqualified to perform the assigned tasks. Whatever the case may be, the supervisors are alerted to the problem by these budget variances and can attempt corrective action before the problem gets any more serious. In either case the feedback can be used to initiate improvements. Sometimes the system must continue to operate as it currently operates because the corrective action that the feedback indicated was necessary exceeds the cost-benefit relationship.



The scope of budgets vary. The narrowest may be limited to a single expenditure such as an advertising budget. A broader scope could be the department budget, for example, the sales department budget. These budgets can be expanded until they reach full width in a budget that covers the entire field of operations and serves as an instrument of control in all departments of the business. It is a forecast of the profits for the period, the cash receipts and disbursements for the period and the financial condition at the end of the period.

The primary purpose of the budget is to raise issues in advance of when they will have to be dealt with. This is done by intelligently preparing the budget with estimates or computed guesses instead of pure guesses. It is assisted by making a coordinated effort. The sub-budgets can be grouped together into one consolidated budget and the total effect can be analyzed. Figure #1 shows how each of four basic budgets interact. The initial estimates are made for productive activity, customer demand and needed resources. With this information an operating budget is prepared. Contained in the operating budget is a profit plan. The net results will be an effect on equities, and indicated change in the balances of some or all of the assets. "To continue operating, a business must produce results (revenue) that are greater than its current period costs (expenses). Revenues and expenses are settled at one time or another by money transfers; but one of the salient features of modern business is the lag of money flows created by credit." (34, p. 2) Since eventually everything is converted to cash, the cash budget becomes essential. The timing of these receipts and disbursements and their conversion into cash is critical in the efficient operation of an enterprise. Using the information contained in the operations and the cash

budgets, a financial budget projects the financial needs of the business and their means of fulfillment. The financial position budget projects

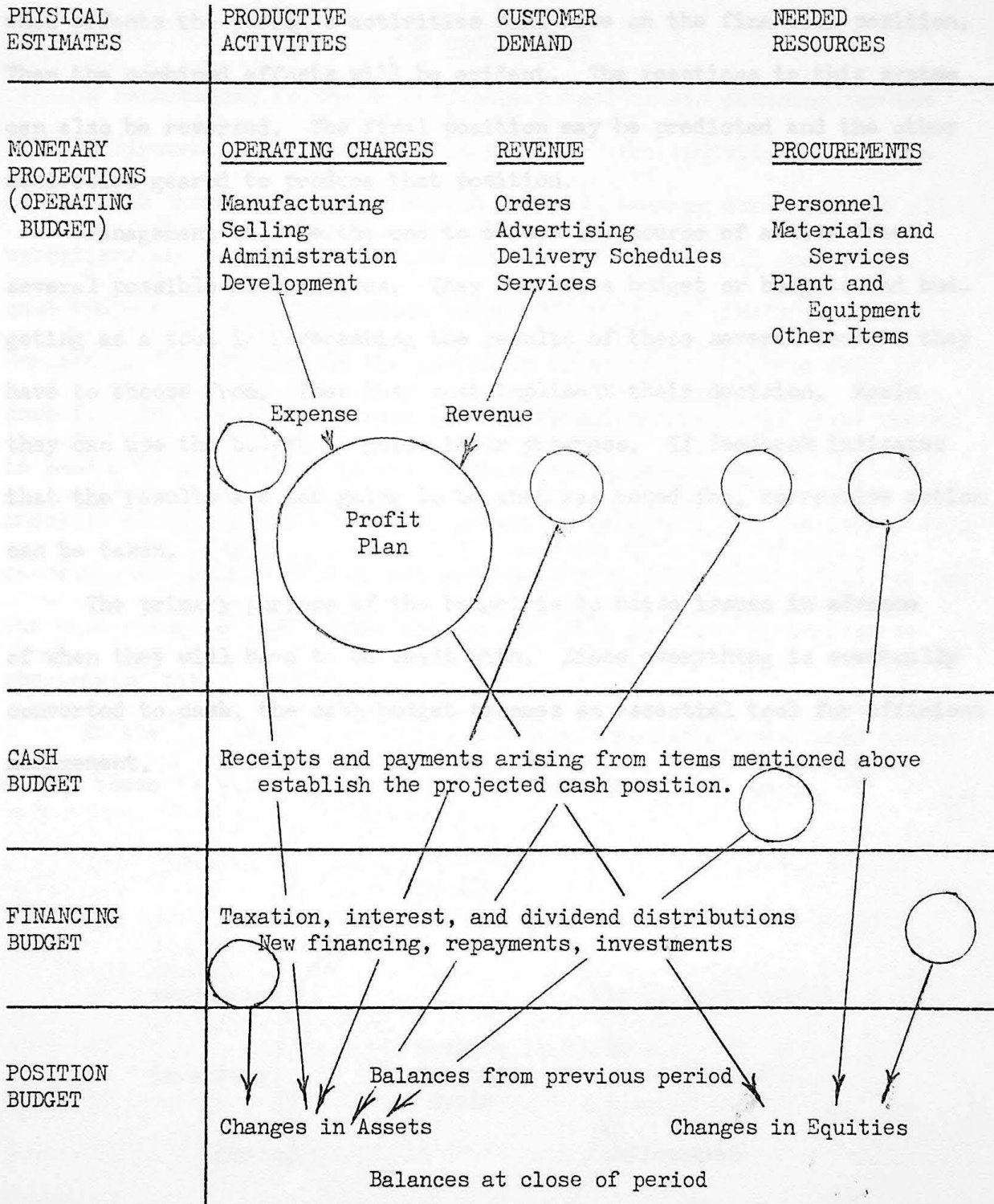


Figure #1, Budget Relationships



budgets, a financial budget projects the financial needs of the business and their means of fulfillment. The financial position budget projects what effects the period's activities will have on the financial position. Then the combined efforts will be evident. The reactions in this system can also be reversed. The final position may be predicted and the other activities geared to produce that position.

Management will be the one to choose the course of action from several possible alternatives. They can use a budget or budgets and budgeting as a tool in forecasting the results of these several courses they have to choose from. Then they must implement their decision. Again they can use the budget to guide their progress. If feedback indicates that the results are not going to be what was hoped for, corrective action can be taken.

The primary purpose of the budget is to raise issues in advance of when they will have to be dealt with. Since everything is eventually converted to cash, the cash budget becomes an essential tool for efficient management.

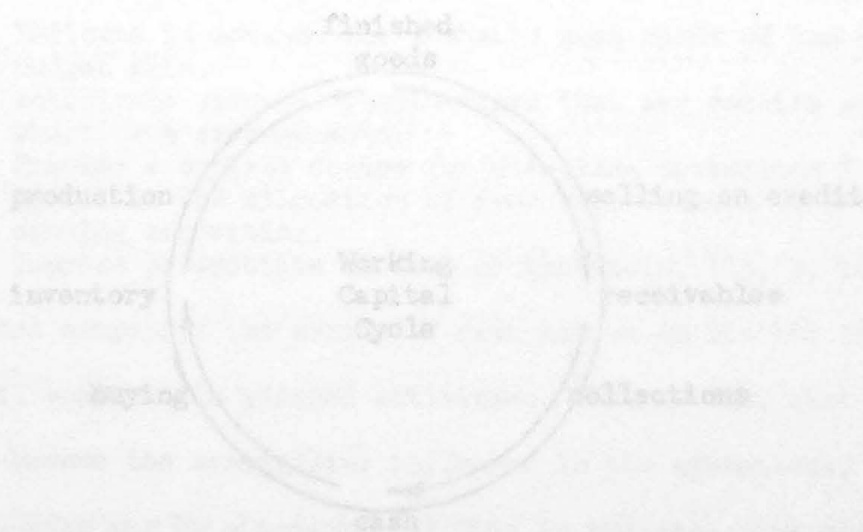


Figure #2

Some other examples are:  
 Merchandising:  
 Cash—Trade payables—Inventory—receivables—cash  
 Cash—Inventory—cash  
 Cash—expenses—Inventory—cash

THE CASH BUDGET

A cash budget is the most effective tool to aid planning for the cash requirements and sources of a business. The individual in charge of the cash budget must think in the broadest company terms because all operations are involved. Because cash is involved in all operations, cash budgeting is very important to the firm and the firm's profits. One author likened cash to the grease in an automobile. "The role of cash is like that of the grease in an automobile. Just the right amount is needed to ensure that it runs without friction and that it will run smoothly in the future. Too much grease is wasteful, but too little will cause the automobile to wear out and break down permanently." (16, p. 320) The cash budget can help eliminate or at least predict any surplus or shortage of cash.

In the typical business cycle there are many different cash cycles. One of these is shown in figure #2, the working capital cycle.

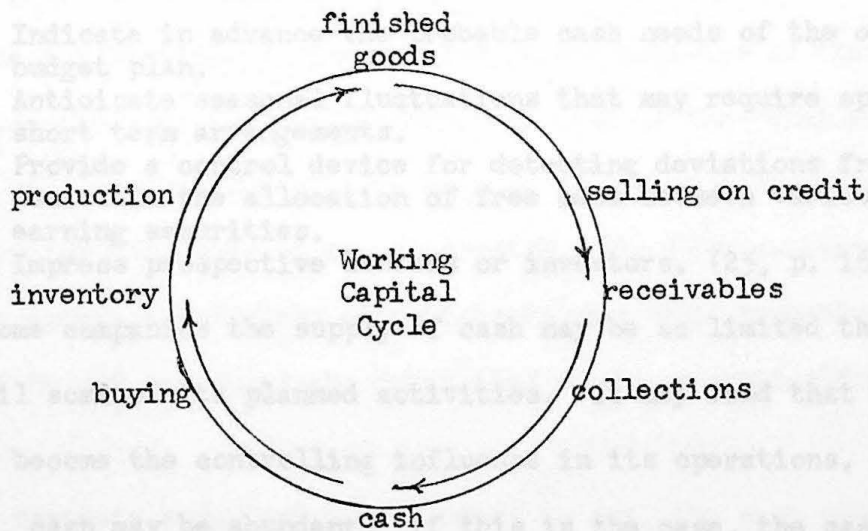


Figure #2

Some other examples are:

Merchandising:

Cash--trade payables--inventory--receivable--cash  
 Cash--inventory--cash  
 Cash--expenses--inventory--cash

Manufacturing:

Cash--productive labor--work in process--finished goods--  
 receivables--cash (Figure #2)  
 Cash--expenses--finished goods--cash

Service:

Cash--productive salaries--receivables--cash

Utility:

Cash--property, plant and equipment--saleable resource--  
 receivables--cash

Each cash cycle has a time span. Some are long, such as those involving the purchase of new plant facilities. Others are short, such as the purchase and sale of popular retail merchandise. Some cash cycles are negative, in that cash is received before it is expended. With the cash budget, an attempt is made to predict the time span of the various cycles. The timing is the essential part of the budget. The cash manager must know when and how much cash will be on hand throughout the entire period. One cash manager has stated these main objectives for a cash budget.

- (1) Indicate in advance the probable cash needs of the over-all budget plan.
- (2) Anticipate seasonal fluctuations that may require special short term arrangements.
- (3) Provide a control device for detecting deviations from plans.
- (4) Assist in the allocation of free cash between various income-earning securities.
- (5) Impress prospective lenders or investors. (25, p. 16-32)

In some companies the supply of cash may be so limited that it must curtail some of its planned activities. It may find that the cash budget has become the controlling influence in its operations. On the other hand, cash may be abundant. If this is the case, the cash budget can prove useful in maximizing the profits by utilization of surplus

cash. Each enterprise must gear its budget to its own environment.

There are four commonly used procedures for preparing a cash budget. The cash receipts and disbursements method is the most popular. This method is the most elastic of the four. Variations on the duration of the forecast can be made easily. A daily, weekly or monthly forecast can be prepared. The other types require a longer time span, because the forecasting involves using the projected balance sheet or the profit or loss for the period. The receipts and disbursements method offers greater flexibility because the effect of irregular earnings are accounted for and can be timed to cash payments or disbursements. The cash receipts and disbursements method requires the greatest amount of work in preparation and the most accurate estimates. It is, therefore, the most costly to prepare. In preparing each of these cash budgets, the availability of other budgeted information would be essential or of great assistance.

There are three approaches to any of these budgets: the maximum, the minimum and the best estimate. The maximum budgets for the maximum need of cash. Operations are geared to produce cash in sufficient quantities that if all "what if" possibilities did occur the enterprise could handle the situation. The minimum is the opposite of the maximum. It gears operations to the possibility that none of the "what if" possibilities will occur. The plan is to have as little cash on hand as is necessary for the needs of the enterprise. The best estimate takes a realistic approach and gears operations to what will probably happen not what might not happen as the "what ifs" of the maximum and minimum budgets do.

If a complete budget plan is already in use, the cash receipts and disbursements approach necessitates translating operating and cost



budgets into estimates of cash receipts and disbursements. An example of a form for a cash budget is appendix A. It is a three month budget and if a longer period of time is to be used then an additional page of the budget can be prepared. Two pages for six months, four pages for a twelve month budget or more can be prepared.

In estimating the receipts it is necessary to know the forecasted sales. The reliability of the sales forecast will affect the cash receipts forecast. Also, it is necessary to determine if the same conditions exist that existed in previous periods. Any changes in conditions must be noted and their effect on sales, cash sales and accounts receivable collections be determined.

The sales forecast should be broken down into cash and credit sales. Past history of the company will prove useful in analyzing trends in sales. A study of the relationship of cash sales to sales for the last several years will give a percentage of the total sales that have been cash sales. This percentage can then be applied to the forecasted sales to give the forecasted cash sales. If there has been a monthly variance in cash sales, an analysis by month may show what can be expected. If the trend is consistent and the variances differ greatly from the yearly information, then the monthly figures should be used.

For the purposes of the following example, it is assumed that the individual months follow the same pattern of each other month. Therefore, the yearly average can be used and be considered relatively accurate. Again, if the months indicate a different pattern, then the Percent Cash Sales and Days' Sales Uncollected must be established on a monthly basis.



Example:

Average Annual Figures

Total Sales	\$9,000,000
Cash Sales	\$1,800,000
% Cash Sales	20%
Credit Sales	\$7,200,000
Year End Accounts Receivable	\$150,000
Days' Credit Sales Uncollected (150,000/7,200,000)	7.4 days

Assuming that the budgeted sales for the month of April, 19x2 are \$750,000 and that the March 31, 19x2 receivables are \$120,000, then the following estimated cash collections can be made.

Estimated Collections From Customers

April 19x2

Cash Sales (20% of 750,000)		\$150,000
Credit Sales (750,000 - 150,000)	\$600,000	
Accounts Receivable, March 31, 19x2	120,000	
Total	<u>\$720,000</u>	

Deduct:

Estimated Accounts Receivable, April 30, 19x2 (7.4 / 30) x 600,000	\$148,000	
Estimated Uncollectable	<u>12,000</u>	<u>160,000</u>
Probable Collections of Credit Sales	\$560,000	
Less Probable Cash Discounts of 1%	<u>5,600</u>	<u>564,400</u>
Estimated Cash Collections		<u>\$714,400</u>

The calculation of the estimated uncollectable receivables should reflect the collection experience of the company. The credit policy, the amount of the receivables, fluctuations, terms of sale, trend of business and discount policy should all be given consideration in determining the amounts of the uncollectable accounts. An estimated aging of accounts receivables could predict the amounts that may become uncollectable. The following is an example of a chart indicating the timing of the collectabilities of the individual months.

Month	Percent Collected Within				Cash Discount	Uncollected
	0-30 Days	30-60 Days	60-90 Days	Over 90 Days		
January	8%	74%	11%	4%	0.75%	2.25%
February	12%	70%	12%	4%	1.00%	1.00%
March	14%	65%	15.5%	3.5%	1.10%	0.90%
April	15%	60%	20%	3%	1.20%	0.80%
May, etc.						

The experience for the month of May through December could be calculated from past experience and plotted for use in the preparation of the cash receipts portion of the cash budget.

The above should work for forecasting the collection receipts of a large number of small customers. If the receivables contain relatively few accounts and these accounts are rather large, the paying habits of each account could be analyzed. The predicted cash receipts could be based on the individual analysis. The case of a combination of some large accounts and many small accounts will make the use of both types of collection procedures useful.

The miscellaneous cash receipts are interest, cash dividends, sales of immaterial items, and other minor or nonreoccurring transactions. They are included as they occur.

To forecast cash disbursements, other budgetary information is useful. Anticipated cash disbursements for operating expenses during the period are estimated from budgets of costs and expenses. The amounts needed for capital improvements or additions should have been included in the capital budget. In forecasting disbursements for expenses, it is preferable to use the purchase budget if one exists. The purchases may not create an immediate expense but may become an increase in inventory. Therefore, the cash requirement to meet these payments will be higher than the expenses would have indicated.

Knowledge of supply practices, billing procedures and credit terms will also indicate the required timing of these payments. If one supplier is continually late in billing and offers a long payment period, then the planned purchase may not have to be a planned payment until several periods later. One method of doing this is to add the outstanding payments to current purchases and deduct the estimated outstanding payments at the end of the period. Probable discounts should be taken into account and deducted from the estimated payables to show the net cash required for the payment in this period.

In estimating the payment requirements, consideration should be given to the reoccurring items such as payroll. If the payroll is a biweekly occurrence, then several months will contain three payrolls instead of just two. The forecast must make these allowances.

Another method of forecasting cash is the adjusted earnings method. The availability of the budgeted income will assist in preparation of the cash forecast. The method is to take the budgeted income for the period, which is normally done on the accrual system of accounting, and adjusting it by the items that don't affect income but do affect cash. Depreciation is an example of an item that doesn't require an immediate outlay of cash but does affect income. Therefore, the amount for depreciation and similarly amortization must be added back to the net income. The excess of cash collections over sales must be added to the income figure and similarly the excess of sales over collections must be deducted. Changes in inventory must also be considered in the conversion of the income to the cash flow. Increases in inventory must be deducted and decreases added to the estimated income. An example of the form that could be used to make these conversions is figure #3.



Cash Receipts and Disbursements\*  
 Quarter ending March 31, 19\_\_

	January	February	March
1. Estimated net profit for quarter.....			
Add:			
Depreciation.....			
Prepaid insurance and other expense written off.....			
Excess collections over sales.....			
Reductions in inventory.....			
Increase in accounts payable.....			
Sale of investment securities.....			
Sale of capital assets.....			
2. Total.....			
Less:			
Excess sales over collections.....			
Payment of accrued taxes.....			
Increase in inventories.....			
Decrease in accounts payable.....			
Purchase of investment securities.....			
Payment to sinking fund.....			
Interest on bonds.....			
Plant and equipment.....			
3. Total.....			
4. Increase or decrease in cash balance (line 1 + line 2 - line 3).....			
Add cash balance beginning of month.....			
Add loans from banks.....			
Cash balance end of month.....			

Figure #3, Adjusted earnings method of cash forecasting

\* (25, p. 16-32)

A cash forecast can be obtained from the predetermined balance sheet method. If a comprehensive budget system is in use, forecast of balance sheets for future dates are prepared. Since the balance sheet includes cash, it generates the forecasted cash balance. However, there may be no relationship during the period to the cash balance and the projected one at the end of the period. Both the balance sheet method and the adjusted earnings method could produce timing errors in the

cash receipts and disbursements. If there are corrections to be made, the cash forecast must wait until many other accounts have been analyzed.

A method of limited use is the working capital differentials method of cash forecasting. In this method, the current assets and current liabilities are projected at future dates. Sale's and production's projections are considered in making the working capital projections.

Heckert and Willson (Business Budgeting and Control) state that: By this method the net working capital at the beginning of each month is adjusted by estimated net income and other receipts and disbursements to arrive at the estimated working capital at the end of each month. From this are deducted the required working capital, excluding cash, and the standard cash balance, to arrive at the amount of cash available for deposit and investment. (25, p. 16-31)

The major objective of this method is the reinvestment of surplus funds. It need not only be concerned with cash but items readily converted to cash. This method has the limitation of directly predicting many variables in arriving at a forecasted cash balance.

All of the afore mentioned methods will predict a cash balance at a future date. All of them are interrelated to the other budgets, if they exist. To be accurate, the information included in these budgets must be given careful consideration. If the income, sales or other forecasts are inaccurate, then the cash forecast may be inaccurate. Timing of the cash balances is very important. Of the methods presented, the receipts and disbursements method is the most widely used. It is the most adaptable to variations in timing of cash transactions and to changes that occur within or without the period. It isolates the item of concern and shows the effects of the enterprise's other activities on the cash balance. A drawback to this method is the time and effort that is required in preparation. However, it is important to emphasize that any of the methods are only as good as the work that has gone into their preparation.



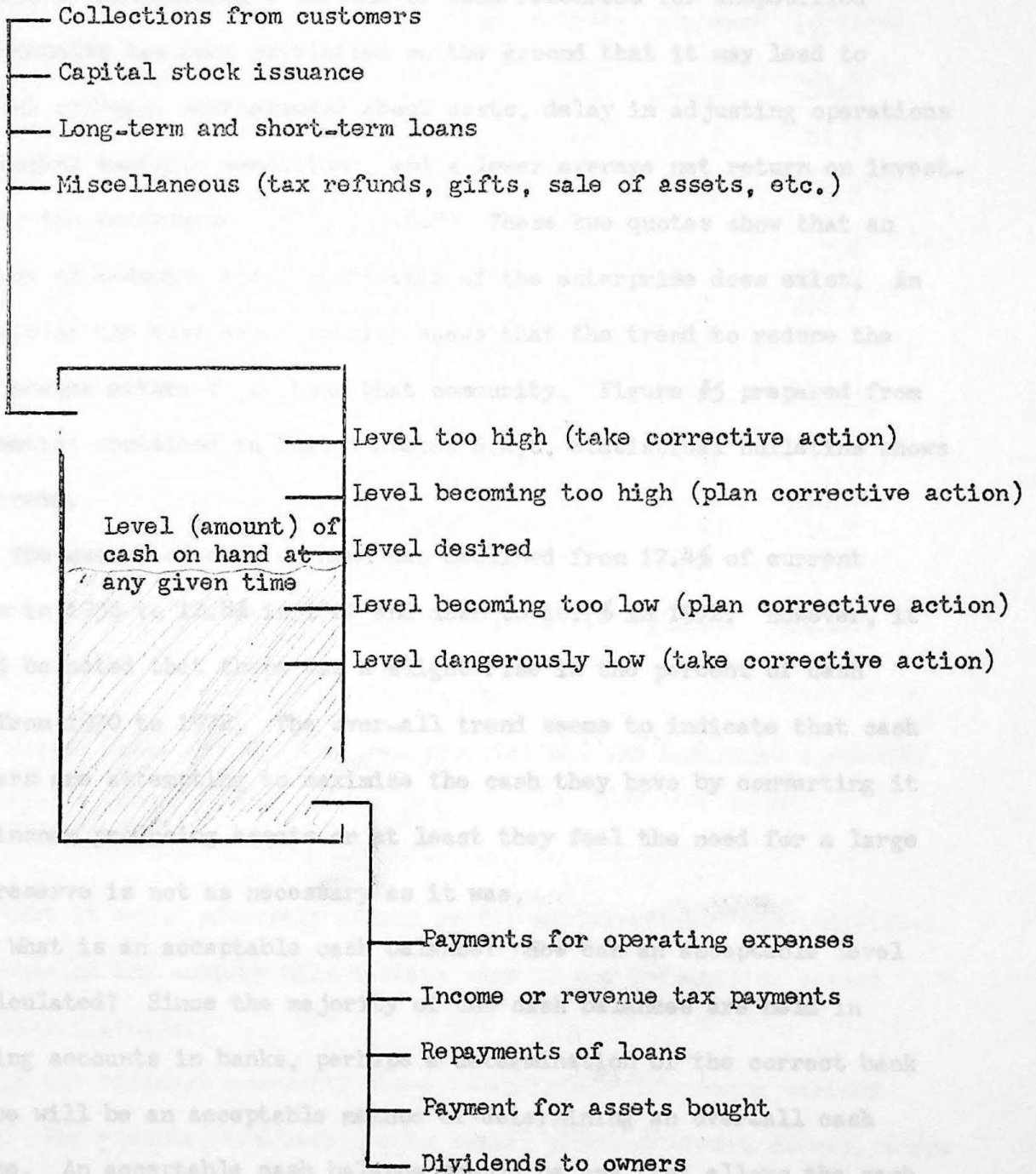
## CASH MANAGEMENT

Once information has been prepared and consolidated, it should be used. The cash budget prepares and consolidates information concerning the cash balance of any enterprise. Good cash management is acting on this information to the benefit of the firm. Management attempts to reach the best level of cash for the business. As stated earlier in a quote: enough cash is needed to run smoothly, too little will cause premature breakdown and too much is wasteful. Figure #4 shows how cash flows through a pool (cash balance) by a stream in (cash receipts) and a stream out (cash disbursements). The level within the pool fluctuates according to the inflows and outflows. The benchmarks that have been established indicate levels of cash within the business. As these levels vary upward, increasing the amounts of excess cash, the action to be taken is to reduce the cash balance. The higher the balance, the more pressing it is that corrective action be taken. As the cash balance flows downward the action of the cash manager is much more necessary. Because of the seriousness of having too little cash, premature breakdown, he must act rapidly and accurately to correct the potentially dangerous situation.

The trend in business has been to reduce the cash balances needed in every day business. One theory on cash "includes the policy of carrying as little cash as is practical for our operation. Any excess cash over this requirement is automatically used to reduce our short-term debt under the flexible arrangements possible with our type of credit agreement." (22, p. 14)

Budgeting Benchmarks for Cash Control\*

Cash Receipts (Inflows)



Cash Disbursements (Outflows)

Figure #4

\* (16, p. 328)

This indicates that an attempt is being made to keep only the amounts of cash necessary for operations on hand and that any excess amounts are to be invested. A quote shows another attitude toward surplus cash. "The practice of maintaining a surplus of cash resources for unspecified contingencies has been criticized on the ground that it may lead to wasteful outlays, carelessness about costs, delay in adjusting operations to changing business conditions, and a lower average net return on investment in the enterprise." (25, p. 16-3) These two quotes show that an attitude of reducing the cash balance of the enterprise does exist. An analysis of the business community shows that the trend to reduce the cash balance exists throughout that community. Figure #5 prepared from information contained in United States S.E.C. Statistical Bulletins shows this trend.

The amount of cash on hand has declined from 17.4% of current assets in 1950 to 12.8% in 1960 and down to 10.7% in 1972. However, it should be noted that there was a slight rise in the percent of cash held from 1970 to 1972. The over-all trend seems to indicate that cash managers are attempting to maximize the cash they have by converting it into income producing assets or at least they feel the need for a large cash reserve is not as necessary as it was.

What is an acceptable cash balance? How can an acceptable level be calculated? Since the majority of the cash balances are held in checking accounts in banks, perhaps a determination of the correct bank balance will be an acceptable method of determining an over-all cash balance. An acceptable cash balance should be one that allows the cash manager some freedom of choice in investment opportunities. It should allow for adequate coverage of current payables. It should not be so



## Current Assets and Liabilities of United States Corporations\*

December 31, 1950, 1960, 1970 and 1972

(In billions of dollars)

	1950**	1960***	1970****	1972****
Current Assets, total.....	<u>161.5</u>	<u>289.0</u>	<u>490.5</u>	<u>561.2</u>
Cash on hand and in banks.....	28.1	37.2	49.7	60.3
United States government securities.....	19.7	20.1	7.6	9.7
Receivables from the United States government.....	1.1	3.1	4.2	3.4
Notes and accounts receivable.....	55.7	126.1	200.6	228.9
Inventories.....	55.1	91.8	196.0	218.2
Other current assets.....	1.8	10.7	32.4	40.7
Current Liabilities, total...	<u>79.8</u>	<u>160.4</u>	<u>302.6</u>	<u>336.8</u>
Advances and prepayments, United States government.....	0.4	1.8	6.6	4.0
Notes and accounts payable.....	47.9	105.0	200.5	216.9
Federal income tax liabilities.....	16.7	13.5	11.8	16.7
Other current liabilities.....	14.8	40.1	83.7	99.2
Net Working Capital.....	<u>81.7</u>	<u>128.6</u>	<u>187.9</u>	<u>224.4</u>

Figure #5

- \* Except banks savings and loan associations and insurance companies.  
 \*\* (31, p. 14)  
 \*\*\* (32, p. 20)  
 \*\*\*\* (33, p. 328)

great that it could adversely affect profit maximization. The individual experience of the company will dictate some of the information needed for proper planning.

In the business community there is an interaction among various groups. For example, the bank grants loans, provides credit checks, stops payment notices and telegraphic transfers, serves the checking facility and provides other services all of which are used by some enterprise. The bank, like the enterprise, is in business to make a profit. Therefore, it should be compensated for its services. If the bank charges for its

services by an as used charge, then there is no problem. The bank will set rates for interest on loans and charges per item of usage in checking accounts at a level so they will generate a profit. However, it is common practice among banks not to charge the checking account customer the full amount of cost and profit that the bank hopes to obtain from its total operations. It instead hopes to make the profit from investing the surplus deposits in the checking accounts. The investible deposits must be of sufficient magnitude that they will generate enough profit for the bank. Although a customer may not be required to maintain any given balance, in the interest of establishing and sustaining good relations with the banking facility, the customer may feel obligated to supply the bank with excess investible demand deposits. The motivation behind this type of reasoning is that in order to have funds available for short or long-term loans at a reasonable rate of interest and to have ease of procurement, the bank must be given a return on the demand deposits. However, it must be an equitable situation to both parties. Therefore, surplus demand deposits must not produce an excessive income to the bank. Figure #6 shows a work sheet that could be used in calculating the minimum balance that will produce the required earnings for the bank. The cost to the bank for processing the transactions of the business should be calculated using the cost per item that most accurately reflects the costs of the unit processing the data. Many banks have a cost analysis of their transactions. If this information is available, it should be used. If not, then a banking average could be used or just a reasonable estimate of the costs. After the costs have been calculated, a reasonable profit is added to the costs. This amount represents the return that will have to be generated by the excess demand deposits.



Calculation of Minimum Compensating Balance

Work Sheet

Bank Processing Costs:

<u>Item</u>	<u>Number of Items</u>	<u>Cost per Item*</u>	<u>Total Cost per Item</u>
Deposit	_____	\$0.1076**	_____
Check	_____	\$0.1614**	_____
Other	_____	\$0.0538**	_____
Total Cost			_____
Bank Profit (4%)***			_____
Total Required Return			=====

Investible Funds Needed  
(required return/rate of return)

Add Federal Reserve Requirement (17%)\*\*\*\*  
(investible funds/(100%-17%)) - investible funds

Add Average Daily Deposit x Float Factor\*\*\*\*\*

MINIMUM BANK BALANCE

Figure #6

- \* Calculated, obtained from bank or estimated
- \*\* (11, p. 36)
- \*\*\* Estimated fair rate of profit
- \*\*\*\* Current reserve requirement for banking facility
- \*\*\*\*\* Average time required of deposits to clear banking system

Dividing the required return by the rate of return the bank receives on its investments produces the investment needed to produce the costs plus profit. The minimum balance must also include funds that cannot be invested, such as the Federal Reserve Requirement and the deposits that have not yet cleared the banking system. The Federal Reserve Requirement is established without reference to individual enterprises. However, the float of the deposits vary according to the business and the nature and location of its customers. If most of the firms receipts are checks from customers located across the country, a higher float factor should be used than if most of the items deposited are from local firms or are in cash. If telegraphic transfers are received frequently, the float factor can be reduced to zero on these funds. To make an example, certain conditions will be assumed and a minimum balance will be calculated. It is assumed that figure #6 per item costs, profit margin and reserve requirement are correct. The number of items processed annually are checks 12,000, deposits 500 and other 100. A float of three days will be used. By applying this information to the work sheet, a cost of \$1,996.68 and a required return of \$2,076.55 are calculated. The investible funds needed to raise the required return are \$51,914. The funds amounted to \$62,547 before the 17% or \$10,633 Federal Reserve Requirement was deducted. Assuming a three day float and an average deposit of \$2,000, the additional amount to compensate for the float would be \$6,000. The total minimum balance in this case would be \$68,547. The increased usage of the account, longer float, higher reserve requirement or higher expected rate of return will all increase the minimum balance.

The variables in the above example make it rather difficult to

accurately predict the actual return the bank will receive from this type of relationship. The other approach, in which the bank charge is an as used or negotiated amount, the enterprise is free to maintain a very minimal balance. If management is alert enough, the cash balance can be reduced to show a negative balance by utilizing a funding policy for the bank account. The experience of the company can be analyzed as to the time it takes payments to creditors to clear the bank. This time lag can be used to temporarily invest the funds. Subsequent to payment, funds are deposited just in time to cover the checks written. An example is shown in figure #7.

#### Analysis of Payroll Releases, Funding and Bank Clearances

	Paycheck Release	Funding	Bank Clearances
Wednesday	1%		
Thursday	21%	10%	4%
Friday	78%	21%	7%
Monday		45%	53%
Tuesday		12%	23%
Wednesday		12%	10%
Total	<u>100%</u>	<u>100%</u>	<u>97%</u>

Based on one quarter's experience for a weekly payroll with an average employment of 3800 people. (3, p. 25)

Figure #7

To assure prudent utilization of the incremental funding of any bank account it will be necessary to have a sure and certain source of cash. Inattention or poor planning will quickly bring disaster in the form of bank overdrafts. If this negative balance would be unsatisfactory on any balance sheet, then just prior to the end of the period it would be necessary to obtain enough cash either by loan or conversion of investments to provide the necessary cash balance. Another consideration that can be used either with incremental funding or separately is the



mailing of the payments on a Wednesday. The time for the mail delivery, the time for the other company to process the check, and the time for the check to clear the bank will produce several days of float time. The Wednesday mailing will assure that the check will be outstanding over the weekend which will give two extra days of the float time. The funding could be delayed until the following Monday on most occasions.

It has been discussed on how to reduce the cash balance and how to establish a minimum compensating balance. It has also been shown that there is a trend in business to reduce the size of the cash balance. Is there a case for retaining a large cash or contingency fund? Several of the advantages have been summarized as follows:

The executive managers of many major corporations have become increasingly desirous of maintaining a level of cash funds which is in excess of the foreseeable operating needs of business. The extra cash is regarded as a reserve, which permits latitude and rapid decision, within limits, in matters involving plant expansion, acquisitions of other companies, acceleration of research or advertising activities, and the like. These excess liquid resources also represent a hedge against the vicissitudes of a business slump or other unforeseen emergencies. To a considerable extent, the growing penchant for long-range planning is supported by the confidence which management derives from the availability of substantial quick assets. (25, p. 16-2)

It appears that one of the main considerations for having a large cash reserve is the confidence it gives management. There is a general feeling that it is better to have too much cash and forego some of the return than to be caught short.

There are some strong arguments against the maintenance of a large cash reserve. The practice of maintaining a surplus of cash resources for unspecified contingencies may lead to wasteful delays, carelessness about costs, delay in adjusting operations to changing business conditions and a lower average net return on investment in the enterprise. The company may be lulled into a sense of security knowing the fact they have



a large reserve. The reserve may suddenly have to be utilized because of slow or nonexistent planning for the event. If the reserve had not existed management might have been more aware of the situation and may have been able to head it off before it became an emergency. Guthmann and Dougall (Corporate Financial Policy) were quoted by Robbins in an article by him and the quote bears repeating here.

...redundant current funds reduce the return on investment and encourage waste and manipulation. Each dollar should do as much work as possible, but idle and unnecessary dollars might better be distributed to the owners of the corporation or be used to reduce debts and save on interest charges. (25, p. 16-2)

It seems to be very important to many of the cash managers that the cash balance is kept to a minimum. One treasurer says that it is the policy in his company to use any excess cash to automatically reduce their short-term debt. Arrangements to do this were written into the financing agreement.

The importance of both investment of excess funds and timing of receipts and disbursements cannot be over emphasized. Figure #8 shows the return on various amounts and differing rate of interest. Small amounts invested for short periods of time do mount up. Any idle funds can be used to generate additional profit provided the cost of administering the investments doesn't exceed the return. Usually there is very little additional cost involved in making these temporary investments. The majority of the work has been done in the preparation of the cash budget, which is usually necessary anyway. Once the determination that an excess or shortage does or will exist, the effort to cope with it is minor. Proper planning provides for better profits.

The investment of excess funds to yield interest or reduce interest charges is important. It is equally important that the receipt or

## Return on Various Sums of Money

Earnings at various rates of interest per annum

Amount	3.50%		4.00%		4.50%		5.00%	
	Week	Year	Week	Year	Week	Year	Week	Year
\$1,000,000	\$673.00	\$35,000	\$769.00	\$40,000	\$865.00	\$45,000	\$961.00	\$50,000
500,000	336.00	17,500	385.00	20,000	432.00	22,500	480.00	25,000
250,000	168.00	8,750	192.00	10,000	216.00	11,250	240.00	12,500
100,000	67.30	3,500	76.90	4,000	86.50	4,500	96.15	5,000
10,000	6.73	350	7.69	400	8.65	450	9.62	500

Figure #8

XYZ Company  
Construction Budget  
City Hall

	Degree of Completion	Time Lapse	Sub Contractor Costs (\$'000)	Own Costs	Profit 10%	Process Billing
Stage 1	To ground level	2 mos.	\$1,000	\$ 500	\$ 150	\$1,650
Stage 2	All buildings closed in	4 mos.	2,000	1,000	300	3,300
Stage 3	Final	<u>2 mos.</u>	<u>3,000</u>	<u>1,500</u>	<u>450</u>	<u>4,950</u>
	Total	<u>8 mos.</u>	<u>\$6,000</u>	<u>\$3,000</u>	<u>\$ 900</u>	<u>\$9,900</u>

Figure #9

disbursement of the cash be timely. The following is an example of how the timing of construction contract payments could either increase the profit on that contract or reduce the total amount of the contract.

Assume bids were being let on the construction of a new city hall. Such contracts normally provide for progress payments by the purchaser as each stage of construction is completed and certified by the architect. The engineer in charge of the project has prepared a budget, based on

estimates and subcontractors' quotes. The budget is seen in figure #9.

The president feels that the total price of \$9,900,000 is fairly close to the final completion costs. However, he wants to know if there is anything that can be done that will increase the profits or permit a lower over-all quote. Some of the things that might be suggested to him are:

1) the bid could call for more frequent payments of partial completion billings. These could be based on a more detailed listing of completion levels.

2) the bid could call for larger initial payments. If the purchaser was concerned with the lowest bid price and not the frequency or amounts of partial billings then this could be used to reduce the total bid cost.

For example, if stage 1 was billed at \$2,150,000 instead of the \$1,650,000, there would be an additional \$500,000 available to the construction company 6 months earlier than the original plan. If this was used to reduce a 7% bank loan, that would be a savings of \$17,500. The company could then reduce its over-all bid by that amount and quote a price of \$9,882,500. The engineer would then have the responsibility of meeting the cost budget and meet the timing schedule.

Timing is important to cash management. It is necessary to have cash in order to invest it. The example of the construction contract clearly showed the importance of timing, but what can be done in the everyday course of business to produce more beneficial timing of cash transactions? Basically there are only two things that can be done: 1) to shorten the cash receipts cycle or, 2) to lengthen the cash disbursement cycle.



Several things can be done to shorten the cash receipt cycle. The first place to start is in the billing. Delays and errors in billing must be eliminated. Invoices should be prepared and mailed the same day the goods are shipped. The use of data processing can help to reduce the time span from shipment until billing. Data processing should also help reduce the quantity of errors. Time can be saved in the collection of receivables. As stated earlier, credit has created a time lag from the expenditure of cash to the receipt of cash. The reduction of length of the credit period can be a place to start. For example, make invoices due upon receipt instead of due from the first of the following month or due upon receipt of a monthly statement. The inclosure of a return envelope with the billing may help speed payments. When feasible, early payment discounts should be offered. Careful attention should be given to the discounts. It should be determined that they are actually having the desired effect on cash flow. Another area for improving cash inflows is banking. Frequent deposits will assure that cash isn't laying around idle waiting for processing. It must get to the bank and cleared through the system before it becomes useful to the enterprise. To speed up deposits, checks should not be delayed by using them to up-date accounts receivable. A photocopy should be made and it can be used to up-date the receivables while the check is being deposited. Direct payment to the bank will save time. One of these procedures is called a "lockbox". The customer remits directly to the lockbox which is under control of the bank. The bank then forwards the accompanying material to the firm. This allows company use of the money before the receipt has been processed. A drawback to this is that the company doesn't have an up-to-date record of the bank balance and therefore must carry a higher buffer.

An attempt should be made to lengthen the cash disbursement cycle. This can be done by holding bills until they are due. The release of checks prior to due date unnecessarily reduces funds available to the firm. If the firm batch processes bills, they can be held after they have been prepared. The checks can be filed under the due dates and distributed when due. Mailing the checks late in the day will give one additional day of float time. Purchase discounts should not be blindly taken. All discounts may not be beneficial. However, any attractive discount should not be carelessly overlooked. An internal yardstick should be used to judge the favorability of each discount. Figure #10 is an example of a yardstick for a company that pays  $10\frac{1}{2}\%$  interest on short-term notes.

#### Purchase Discounts

Cash Discount per \$100,000	Invoice Terms		
	1%10-N30	$\frac{1}{2}\%$ 10-N30	$\frac{1}{4}\%$ 10-N30
Amount of discount earned	\$1,000	\$500	\$250
Cost of money for 20 days @ $10\frac{1}{2}\%$ annual cost of money	<u>575</u>	<u>575</u>	<u>575</u>
Gain or (Loss) from taking discount	\$ 425	(\$75)	(\$325)

Figure #10

A final area of controlling cash is the centralization of accounts. Decentralized operations frequently mean that there are numerous "courtesy deposits". That is maintaining several minimum balances in several banks. These should be examined to see if the company is actually receiving any

real benefit from them. The centralization will also aid the timing of payments and the availability of temporary cash surpluses of significant magnitude. The cash manager has done what he can to increase the availability of cash and has prepared a budget for the coming period. The budget shows that cash is not at the desired level. Assuming that the cash balance is lower than necessary, short-term financing must be arranged. The cash planning that has been done may make it easier to obtain the required financing. If it can be forecast and explained, the lender may feel that a temporary shortage of cash is not an indicator of poor management and a foreshadowing of bad times ahead. Proper budgeting will be able to predict when the loan will be repaid. These may increase the availability of funds and thereby reduce the cost of the funds.

Sources of funds are varied. (See figure #11) One source is the factoring of accounts receivable. By factoring the time lag from sale to collection will be shortened. Customer financing can provide temporary funds. Advances from customers may provide a substantial interest free loan. Large suppliers may sometimes grant credit on purchases at a rate more favorable than a lending institution. The supplier, because of his size, may have secured money at a rate better than the smaller accounts could. He may pass his savings along to his customers. Inventories, like receivables, can be the basis for borrowing cash. The inventory can serve as collateral. Inventories have a strong tendency to be higher than necessary, and if it is necessary to borrow money to purchase inventories, the cost of the money for the purchases may offset the profit on the sale of the goods. Sale and leaseback of plant and equipment can also improve the cash position. Disposition of idle assets can produce the needed cash without having to pay interest or repay the



the principal. It is costly to have cash tied up in slow moving or obsolete inventory. Whatever becomes the source of needed cash, advance warning will aid in securing the best source.

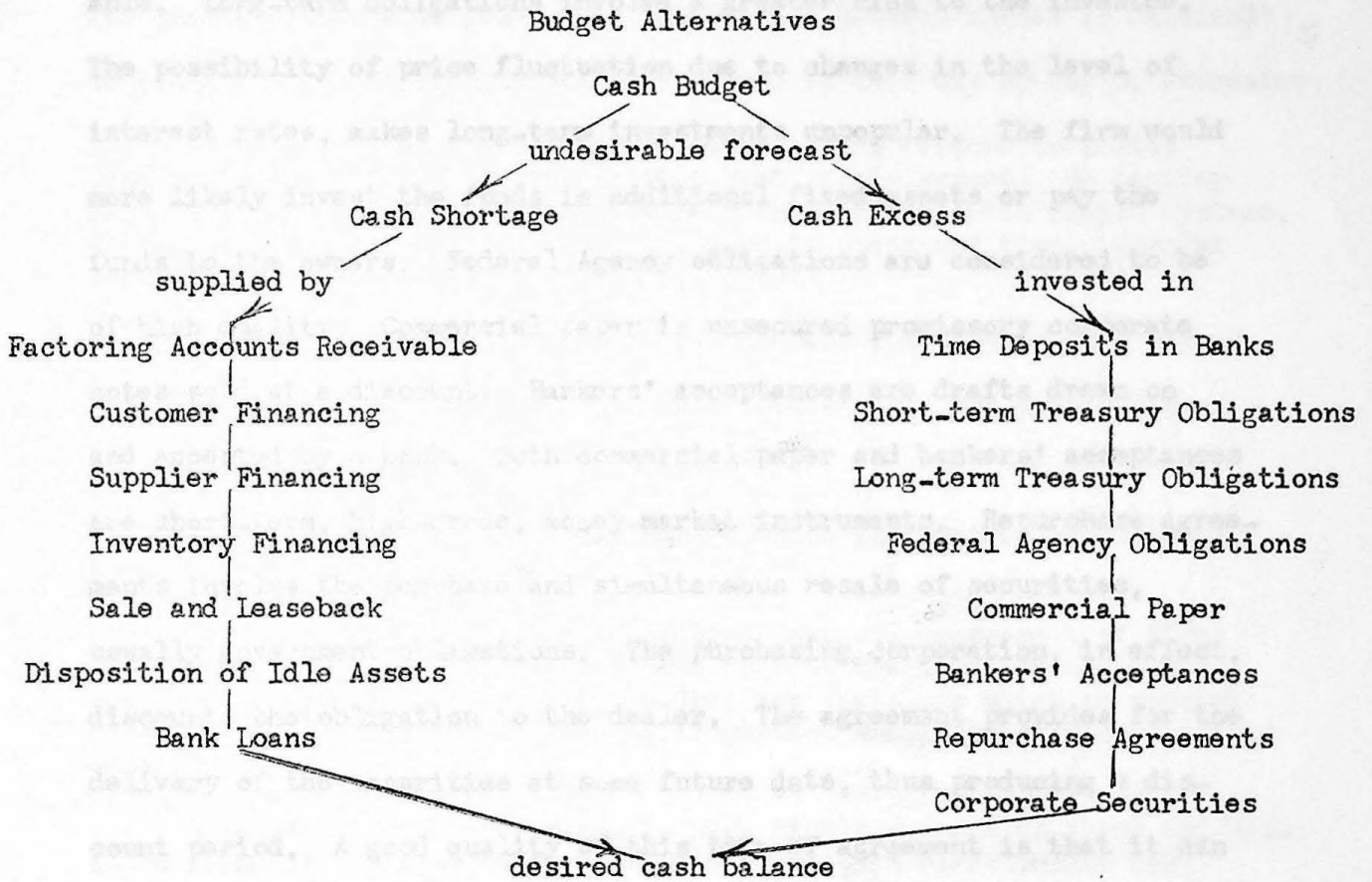


Figure #11

Now assume that the cash balance is in excess of the required needs. Several alternatives exist for the investment of these funds. A prime consideration is how long will these funds be in excess. If the length of availability of funds is not certain, the investment must be readily convertible to cash. A modest rate of return may be obtained by depositing the portion of the cash not immediately required in a bank as a time deposit, which is subject to advance notice of 30 days to 6 months before withdrawal, or against a certificate of deposit with a fixed maturity. The most common investment for corporate funds is short-term

government securities, which give the twin advantages of safety and liquidity. Treasury bills, certificates of indebtedness, tax anticipation notes, and Treasury notes and bonds maturing within 5 years are available. Long-term obligations involve a greater risk to the investor. The possibility of price fluctuation due to changes in the level of interest rates, makes long-term investments unpopular. The firm would more likely invest the funds in additional fixed assets or pay the funds to the owners. Federal Agency obligations are considered to be of high quality. Commercial paper is unsecured promissory corporate notes sold at a discount. Bankers' acceptances are drafts drawn on and accepted by a bank. Both commercial paper and bankers' acceptances are short-term, high-grade, money-market instruments. Repurchase agreements involve the purchase and simultaneous resale of securities, usually government obligations. The purchasing corporation, in effect, discounts the obligation to the dealer. The agreement provides for the delivery of the securities at some future date, thus producing a discount period. A good quality of this type of agreement is that it can be tailor made to individual cases. The purchase of corporate securities as an investment is becoming increasingly unpopular. Because of the speculative nature, investment in corporate securities except those of subsidiaries has usually been replaced by capital expansion of plant and facilities or investment in one of the other alternatives.

A cash budget will forecast an enterprise's cash position. Management must act upon that forecast. It can take steps to increase the availability of cash. Or, it may have to secure additional short-term or long-term financing. Also, it may find it has funds to invest. The cash budget shows an operational forecast to which management adds its

financial decisions. The budget is just a tool of management. However, being a tool it must be properly used to be of any benefit. The environment today is so complex that it is difficult to stay abreast of all the possibilities available. The interaction between forces is difficult to isolate. The difficulty has been summed up this way by Jay W. Forrester:

Complex systems are counterintuitive. They respond to policy changes in directions opposite to what most people expect. We develop experience and intuition almost entirely from contact with simple systems, where cause and effect are closely related in space and time. Complex systems behave very differently. (13, p. 191)

The idea of simulation budgeting has been put forward as a way to cope with some of the complexity. This idea assumes two propositions and then makes a hypothesis. They are:

Proposition One: All firms must operate in a future which is uncertain.

Proposition Two: Given Proposition One, all management of firms will make some decisions that are incorrect in the light of the actual results as they later materialize. They are decisions which go counter to those which would have been made if perfect knowledge of future events were available.

Hypothesis: One difference between highly successful firms and mediocre firms is the speed with which their managers react to the new information as it unfolds out of the uncertain future. The sooner that the management adjusts the plans that are incongruous with new information, the less will be the negative impact on profits. (20, p. 59)

Assuming the above, it is possible to construct a corporate model and plug in the various possibilities. The use of the computer makes the task of performing the actual work less burdensome. Once the parameters have been supplied, the computer can show the end result of the interaction of several alternatives. This can be used to learn the combined influence of independent decisions. Alternative profit plans can be evaluated with respect to cash flow. Various investment or financing possibilities can be judged on their respective merits. Timing of receipts and disbursements can be compared for compatibility. The



simulation model can be simple or very complex depending on need for accurate and timely information verses the cost of getting that information.

This paper has talked about what can be done, but what is actually done? Robert M. Soldosky and Dennis R. Schwartz, (Financial Executive, October, 1972), conducted a study in the first part of 1971 to find out what actual practices were. They surveyed construction and farm equipment manufacturers. There was a division in the survey group between large and small manufacturers. The study showed that nearly all of the large firms made some study of cash flow from receivables. Relatively few of the small firms made any such study. Almost all of the firms made some type of cash forecast, usually for periods less than one year. All companies that made forecasts made some projection errors. One firm had an extremely low variance error from projected cash balance to actual balance. However, the low error rate wasn't because of excellent predictions but because any error in predicting receipts was offset by either increasing or reducing cash disbursements a corresponding amount. The predominate source of short-term funds was the commercial bank. The larger firms did invest short-term cash excesses and preferred commercial paper and treasury bills. The smaller firms overwhelmingly preferred treasury bills. Some of the firms utilized advanced computerized and statistical methods in their cash management and short-term investment practices. The large firms were continuing to make improvements in already well established cash management systems. Several of the small firms indicated that any additional effort in cash budgeting, investment, financing or management would not be warranted because such effort would cost more than it would save.

The point made by the small firms about the cost-benefit relationship is a salient point. Any effort should produce a return greater than that expended. Good cash management is designed to increase the profitability of the enterprise. To do this, the tool, cash budgeting, is used. The cash manager must be aware of his minimum cash needs and be also aware of the avenues he has for financing shortages or utilizing excesses. His strongest guiding factor should be that when everything has been considered, will any particular course of action cost more to perform than will yield in benefits?

Appendix A

Forecast of Cash Receipts and Disbursements  
April to June, 19\_\_

	April		May		June	
	Budget	Actual	Budget	Actual	Budget	Actual
Estimated Receipts:						
Cash Sales.....						
Collections from Accounts Receivables.....						
Other.....						
Total Receipts.....						
Estimated Disbursements:						
Accounts Payable.....						
Payroll.....						
Expenses.....						
Advertising.....						
Interest Expense.....						
Plant and Equipment.....						
Bank Loan Repayment.....						
Other.....						
Total Disbursements.....						
Estimated Excess(Shortage) of						
Cash Receipts over Disbursements..						
Estimated Balance						
beginning of month.....						
Estimated Balance						
end of month.....						

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