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Volume Title: Industrial Demands upon the Money Market, 1919-57: A Study in Fund-Flow Analysis

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Volume Publisher: NBER

Volume ISBN: 0-87014-420-0

Volume URL: <http://www.nber.org/books/payn61-1>

Publication Date: 1961

Chapter Title: Appendix: The Analytical Mechanism for Fund-Flow Measurement

Chapter Author: Wilson F. Payne

Chapter URL: <http://www.nber.org/chapters/c5019>

Chapter pages in book: (p. 87 - 139)

Appendix

The Analytical Mechanism for Fund-Flow Measurement

So far, our discussion has been kept as free as possible of technical matters. Nevertheless, methods of measurement underlie the records of events, giving them validity and pertinence. This appendix, therefore, takes up the problem of measuring the fund flows already presented.

THE TRANSACTION RECORD

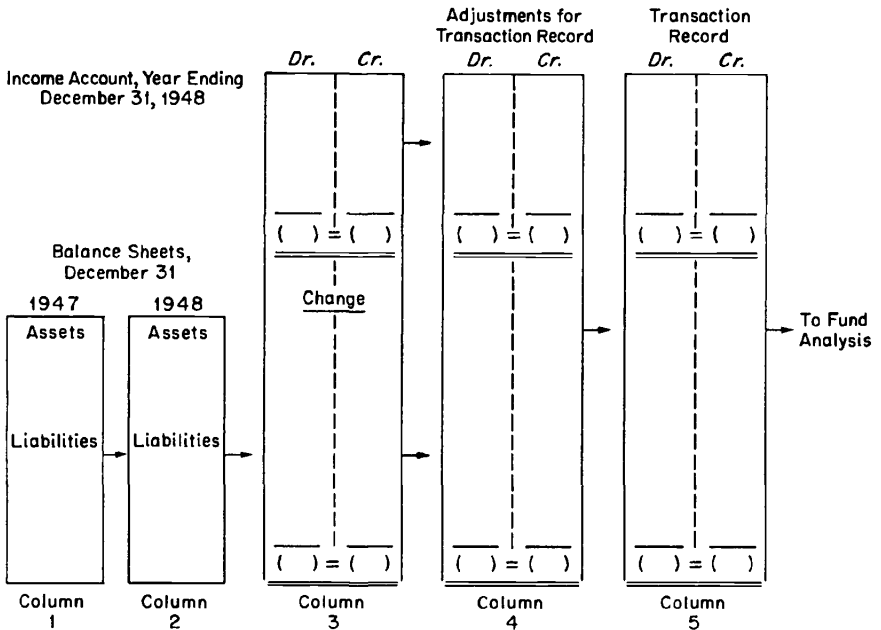
The foundation for fund analysis is the transaction record. This is a statement, as nearly as it can be reconstructed, of all of the transactions in which a company engaged during the accounting period. It is made up of the income account, the enclosing balance sheets, and all of the supplementary information available. Until this record has been established, as firmly as data permit or the needs of the analyst dictate, no fund analysis may take place. The preparation of the transaction record will be easier to follow if it is outlined in blank form (Chart A-1) before company data are inserted.

Columns 1 and 2 contain the beginning and closing balance sheets, and the change in each account is entered in column 3, which also contains the income statement for the period. Column 3 would serve as the transaction record, were it not for the fact that revaluations and reserves may have been entered; since these may look toward future transactions, rather than to realized transactions of the past, they will be reversed in column 4. If any rearrangement of the company's capital structure has been effected at other than stated liability values, and if the difference has been absorbed by earned or capital surplus, this difference too will be reversed. An analyst working on a large number of companies might have to be

The Analytical Mechanism for Fund-Flow Measurement

CHART A-1

Diagram of Worksheet for Preparation of Transaction Record



prepared to make as many as 100 different types of adjustments. Column 4 is also the place to enter supplementary data (if the information is deemed necessary) covering, for example, debt turnover, purchase and sale of securities, and sale of plant. Column 5, reflecting these adjustments to column 3, thus comes as close as possible to being a list of realized transactions at actual prices.

In Table A-1 the Allis-Chalmers figures for 1948 are set out in such a framework.¹ The only adjustments which appeared necessary to derive the 1948 transaction record from column 3 concern the reserve which, according to the annual report, is "a precautionary reserve against future inventory price declines and any other contingencies that might arise." The technician will wish to note that if the reserve had been stated as

¹ For the sake of brevity I have condensed the published statement. Net sales, \$328,101,000, have been combined with interest and discounts, \$929,000, and royalties, \$230,000. Cost of goods sold; selling, general, and administrative expenses; interest, and miscellaneous expenses have been combined in the total, \$299,915,000. Among the current liabilities, several accounts are combined under the title of accounts payable, \$51,536,000. These include, in addition to accounts payable, payrolls accrued, reserve for guarantees and completion of contracts, general taxes, progress billings and advance

The Analytical Mechanism for Fund-Flow Measurement

an offset to the asset account, its reversal would have increased the total asset difference (now \$51,443,000) with which the transactions in total assets must reconcile. In all probability, the dealings in U.S. securities are understated at \$6 million, since a portion of those on the books at the beginning of the year were either liquidated or surrendered for the payment of income taxes and replaced by others.

It will be observed that certain items in the transaction record are not themselves transactions but rather reports of the present status of other transactions still uncompleted (for example, the change in payables, in receivables, and in tax liability). Nor does depreciation as a debit signify a payment. Thus, the transaction record is a conglomerate of overt exchanges, changes in the condition of unpaid bills, nonoperating assets charged to sales, and changes in the values of certain assets, such as cash, inventory, and plant.

DERIVATION OF FUND FLOWS

The next step is to employ the transaction record in the determination of fund flows (for example, the flow of cash, the circulation of working capital, total assets, or any other asset group), and this must be done according to information drawn from the record. Only one flow may be derived at a time, although the general procedure is the same for all. The nature of the processes will appear more readily if, again, the schematic diagram (Chart A-2) is presented in advance.

In Chart A-2, column 5 is the transaction record as carried over from Chart A-1. The functions of columns 6, 7, and 8, with headings set up for tracing cash, are to carry the adjustments, to report the fund flow, and to show the change in the fund.

Each entry in the transaction record is examined for its effect upon the fund under observation. If a transaction has no effect upon the fund balance, it is blanked out by an entry in the adjustment column, column 6, so that nothing will appear in column 7, which reports the flow of the fund. The cost of sales, for instance, is blanked out for the total asset analysis. If a group of transactions affects the fund balance by less than the

collections on contracts, sundry accruals, and other current liabilities. Although many different types of transactions brought these accounts into being, and they should and can be treated on their individual merits, the reader is asked to join in the fiction that they are all trade payables. During 1948 the reserve for employer's liability insurance changed in the amount of \$2,000. This difference has been incorporated in the sundry accruals to shorten the discussion. Accounts receivable (trade receivables) have been stated net of reserves for discounts to be taken by customers.

The Analytical Mechanism for Fund-Flow Measurement

TABLE A-1
 PREPARATION OF TRANSACTION RECORD, ALLIS-CHALMERS MANUFACTURING COMPANY, 1948
 (thousands of dollars)

	(1)		(2)		(3)		Adjustment for Transaction Record		Transaction Record (Col. 3 + Col. 4)	
	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
<i>Income account, year ending Dec. 31, 1948</i>										
Net sales and other income				329,260						329,260
Costs, selling, and other expenses	299,915				299,915				299,915	
Depreciation	3,103				3,103				3,103	
Net profit			26,242		26,242				26,242	
Provision of reserve for federal income tax	10,800								10,800	
Reserve for inventory	1,270						1,270		0	
Dividends	5,193								5,193	
Net transfer to surplus	8,979						1,270		10,249	
	329,260			329,260					329,260	
										329,260

The Analytical Mechanism for Fund-Flow Measurement

	1947	1948	Change	
<i>Balance sheets, December 31,</i>				
Cash	10,596	18,133	7,537	7,537
U.S. and other securities	9,000	15,000	6,000	6,000
Trade receivables	27,005	44,466	17,461	17,461
Inventory	109,496	125,016	15,520	15,520
Other current assets	1,061	1,702	641	641
Investments and advances	0	0	0	0
Fixed assets (net)	44,693	48,780	4,087	4,087
Deferred charges	356	576	220	220
Other assets	240	217		
	<u>202,447</u>	<u>253,890</u>		23
Notes payable to banks	0	15,000	15,000	15,000
Accounts payable	42,777	51,536	8,759	8,759
Reserve: federal income tax	5,019	12,454	7,435	7,435
Term loan, 1950-53	0	10,000	10,000	10,000
2% debentures, 1956	15,000	15,000	0	0
Reserve: inventory, contingencies	3,730	5,000	1,270	1,270
Reserve: employer's liability insurance	813	813	0	0
Preferred stock	35,937	35,937	0	0
Common stock and paid-in surplus	72,706	72,706	0	0
Earned surplus	26,465	35,444	8,979	8,979
	<u>202,447</u>	<u>253,890</u>	<u>51,466</u>	<u>51,466</u>
			<u>2,540</u>	<u>2,540</u>
			<u>1,270</u>	<u>1,270</u>
				<u>10,249</u>
				<u>51,466</u>
				<u>51,466</u>

SOURCE: Annual reports of the company.

TABLE A-2
 WORKSHEET FOR DERIVING PAYMENTS AND RECEIPTS OF CASH, ALLIS-CHALMERS MANUFACTURING COMPANY, 1948
 (thousands of dollars)

	Transaction Record		Adjustments		Cash		Change in Cash	
	Dr.	Cr.	Dr.	Cr.	Payments	Receipts	Dr.	Cr.
	(5)		(6)		(7)		(8)	
Sales and other income		329,260		17,461(1)		311,799		
Costs and other expenses	299,915			15,520(2)	8,759(3)	307,537		
Depreciation	3,103		641(4)		3,103(8)			
Net profit	26,242		220(5)					
Provisional reserve, federal income tax	10,800						3,365	
Dividends	5,193						5,193	
Net transfer to surplus	10,249						10,249(7)	
	329,260	329,260					(316,095)	(311,799)
							(4,296)	

The Analytical Mechanism for Fund-Flow Measurement

Cash	7,537				7,537
U.S. and other securities	6,000				6,000
Trade receivables	17,461		17,461(1)		
Inventory	15,520		15,520(2)		
Other current assets	641		641(4)		
Investments and advances	0				0
Fixed assets (net)	4,087			3,103(8)	7,190
Deferred charges	220		220(5)		
Other assets		23			23
Notes payable, short-term		15,000			15,000
Accounts payable		8,759		8,759(3)	
Reserve: federal income tax		7,435		7,435(6)	
Term loan		10,000			10,000
Bonds		0			0
Preferred stock		0			0
Common stock		0			0
Earned surplus		10,249		10,249(7)	
	51,466	51,466	63,388	63,388	329,285
					336,822
					7,537
					7,537

SOURCE: Table A-1. Figures in parentheses in column 6 are used to key text discussion of adjustments to table entries.

The Analytical Mechanism for Fund-Flow Measurement

The adjustment column, column 6, also serves another purpose. It enables the analyst to relocate transaction data to suit his needs. If he wants all recorded purchases of inventory in one place, he may combine the divided reports of the income account and balance sheet. If he is deriving the flow of total assets, he may diminish sales by depreciation (and costs) to obtain net profit, while leaving reported total assets undisturbed, as they undoubtedly would be disturbed by the addition of depreciation to the net change in plant. In these and many other ways column 6 gives easy mobility to the blocks of information with which the analyst constructs the quantitative answers to questions he has designed.

Column 7, detailing the flow of the fund, is the end product of the process just described. It is a simple statement that on this or that account so-and-so much of the fund was either paid out or received, and that, *in toto*, this much was paid out and that much received, the difference equaling the changed balance of the fund, as reported in column 8. In the schematic diagram, column 7 has a "not equal" sign between the totals of payments and of receipts. This is only an indication of probability, since it is possible, though not probable, that they might, in some instance, balance.

Column 8 shows the net change in the fund balance and details the changes of its members where the fund is a multiple-item compound. It will be noted that exchanges between members of a fund do not change its balance and are not, therefore, entered in the flow column but, rather, in column 8, as qualitative shifts within the fund itself.

We may turn now to company data and the derivation of the cash, total-asset, and working-capital flows.

Adjustments to the Transaction Record for the Derivation of Cash Flow

In order not only to describe how the transaction record is made to yield up the cash flow, but also further to illuminate the special convenience of the "adjustment method" in reaching that goal, we shall give, in certain transactions involving the operating budget, first, the formal, traditional accounting schedule for the derivation of, e.g., collections; second, the arithmetic equivalent; and third, the adjustment method of obtaining the same answer. It will be noted that the adjustment method permits the derivation of the fund flow directly from the transaction record without having to refer back again to the balance sheet.

The Analytical Mechanism for Fund-Flow Measurement

I. Operating transactions

Collections

A. Conventional method

Accounts receivable

Beginning balance	27,005
Add sales	329,260

Total to collect	356,265
Less closing balance (uncollected)	44,466

Equals collections	311,799
	=====

B. Arithmetically

Beginning less closing balance	-17,461
Add sales	329,260

Equals collections	311,799
	=====

C. Adjustment method (numbered adjustments correspond to those of Table A-2)

	Transaction Record		Adjustments		Cash	
	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Payments</i>	<i>Receipts</i>
					(<i>Dr.</i>)	(<i>Cr.</i>)
Sales, net		329,260	17,461(1)			311,799
Accounts receivable	17,461			17,461(1)		

Of course, the adjustment in the third method might equally well have been to the accounts receivable line. And no objection could be raised on grounds of logic. But it will simplify matters if we make a practice of transporting all operating-budget transactions to the income account, thus leaving to the balance sheet the capital budget and money-market transactions.

In conventional accounting notation, entries appearing in the debit column generally represent outlays for the object named in the account title; credit entries generally report "intakes" of money, IOU's, or goods and services. In the adjustment system of deriving *cash* flows it would be misleading, therefore, to allow the debit change in accounts receivable to go unimpeded to the cash column, because under conventional notation it would there appear as an outlay; and of course the treasurer cannot lay out what he has not got his hands upon.

Trade receivables of longer maturity than one year are reported by some companies and carried in the noncurrent section of the balance sheet. Changes are adjusted the same as current receivables.

The Analytical Mechanism for Fund-Flow Measurement

Production Payments

The derivation of cash payments for the acquisition of goods and services on current account will next be undertaken. Acquisition for current account refers to goods destined directly for the customer, and these must be differentiated from such things as newly installed equipment, of which only the output or life is destined for the customer. In arriving at production payments it is necessary first to find purchases and then to learn by an inspection of accounts payable if they have all been paid for.

The assets acquired on current account include more than inventory; they embrace a miscellany of things under the general title of other current assets. The changes in this or similar accounts are adjusted, like inventory, to production payments. Similarly, other current liabilities, arising in connection with the intake of current goods and services, are adjusted, like accounts payable, to the production payments line (taxes payable and dividends payable are treated individually). We can be rather sure, on principle, that the current accounts, both assets and liabilities, exclude capital budget and capital structure items; the main task, therefore, is to determine only whether the account originated in our relations with our customers or with our suppliers. Sometimes noncurrent liabilities (e.g. reserve for self-insurance) come into existence via charges to income. Changes in such accounts will be adjusted back to costs in order to preserve an exact statement of cash transactions. Also, I prefer, though I cannot exercise my preference in all collections of financial data, to adjust increases in deferred charges to the production payments line, on the ground that such expenditures fall within the operating budget. Decreases in deferred charges naturally must be adjusted; if they were not, cost of goods sold would overstate the cash outlay, and at the same time the creditward movement of the account, if permitted to appear in the flow column, would indicate a receipt of cash.

The Analytical Mechanism for Fund-Flow Measurement

A. Conventional method	
<i>Inventory</i>	
Closing balance (unsold)	125,016
Add shipments	299,915
	<hr/>
Total in hand during year	424,931
Less beginning balance	109,496
	<hr/>
Equals purchases this year	315,435
	<hr/> <hr/>
<i>Accounts payable</i>	
Beginning balance	42,777
Add purchases, to pay	315,435
	<hr/>
Total to pay	358,212
Less closing balance (unpaid)	51,536
	<hr/>
Equals payments this year	306,676
	<hr/> <hr/>
<i>Other current assets</i>	
Closing balance	1,702
Add charges to sales	n.a.
	<hr/>
Total in hand during year	n.a.
Less beginning balance	1,061
	<hr/>
Equals acquisitions this year (net)	641
	<hr/> <hr/>
<i>Deferred charges</i>	
Closing balance	576
Add charges to sales	n.a.
	<hr/>
Total in hand during year	n.a.
Less beginning balance	356
	<hr/>
Equals acquisitions this year (net)	220
	<hr/> <hr/>
<i>Summary of payments</i>	
For purchases	306,676
For other current assets (net)	641
For deferred charges (net)	220
	<hr/>
Total production payments	307,537
	<hr/> <hr/>

The Analytical Mechanism for Fund-Flow Measurement

(If the residual figure for other current assets or for deferred charges is negative, it will be subtracted in the summary of payments, indicating that more of the asset was charged to sales than was acquired in the year.)

B. Arithmetically

Inventory

Closing less beginning balance	+15,520
Add cost of goods shipped	299,915

Equals purchases	315,435
------------------	---------

Accounts payable

Beginning less closing balance	-8,759
Add purchases this year	315,435

Equals payments this year	306,676
---------------------------	---------

Other current assets

Closing less beginning balance	+641
--------------------------------	------

Deferred charges

Closing less beginning balance	+220
--------------------------------	------

Total production payments	307,537
---------------------------	---------

C. Adjustment method

	Transaction Record		Adjustments		Cash	
	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Payments</i>	<i>Receipts</i>
					(<i>Dr.</i>)	(<i>Cr.</i>)
Costs and expenses	299,915		15,520(2)	8,759(3)	307,537	
			641(4)			
			220(5)			
Inventory	15,520			15,520(2)		
Other current assets	641			641(4)		
Deferred charges	220			220(5)		
Accounts payable		8,759	8,759			

In the adjustment method, if we had let the change in inventory go through unadjusted to the cash column the only harm that would arise is that information about the acquisition of goods would lie in two places rather than one. But if inventories had decreased, i.e. moved creditward, then the cost figure, if left to stand alone, would overstate the cash outlay. Similarly, if the change in accounts payable had been allowed to go as a credit to the cash column, "costs" would overstate cash payments while

The Analytical Mechanism for Fund-Flow Measurement

the change in accounts payable would appear as a cash receipt, which it is not.

Depreciation

Depreciation is properly a charge against sales and represents the amount of its life that plant has given up to the product in the period. But depreciation is not a cash outlay and must be prevented from appearing as such in the cash-flow column.

Net Profit

Since we have treated separately the principal sums of which it is the net balance, net profit has no further utility and must be dropped from consideration. The same is true for net profit after taxes.

Income Tax Payments

The income account reflects the amount of tax liability incurred this year as a result of profitable operations. The balance sheet shows the amount of income taxes remaining unpaid.

To obtain the amount of tax payments by the three methods:

A. Conventional method

<i>Reserve: federal income tax</i>	
Beginning balance (unpaid)	5,019
Add liability incurred this year	10,800
	<hr style="width: 100%;"/>
Total to pay	15,819
Less closing balance (unpaid)	12,454
	<hr style="width: 100%;"/>
Equals income tax payments this year	3,365
	<hr style="width: 100%;"/>

B. Arithmetically

Beginning minus closing balance	-7,435
Add liability incurred this year	+10,800
	<hr style="width: 100%;"/>
Equals income tax payments this year	3,365
	<hr style="width: 100%;"/>

C. Adjustment method

	Transaction Record		Adjustments		Cash	
	Dr.	Cr.	Dr.	Cr.	Payments (Dr.)	Receipts (Cr.)
	<hr style="width: 100%;"/>		<hr style="width: 100%;"/>		<hr style="width: 100%;"/>	
Provision of reserve: income tax	10,800			7,435(6)	3,365	
Reserve: income tax		7,435	7,435(6)			

The Analytical Mechanism for Fund-Flow Measurement

Under the adjustment method, the provision of reserve for income taxes in the income account, if left unadjusted, would have overstated the cash payment while the creditward movement of the liability account, if permitted to appear in the cash-flow column, would have indicated a cash receipt, an implication far from reality.

Dividend Payments

The declared dividends may be assumed to have been paid, on the ground that no current liability (dividends payable) appears on the balance sheet. If such an account were to appear, cash payments would be derived in a way similar to income taxes. Sometimes, stock dividends are declared. In such cases two pairs of adjustments are needed for the preparation of the *transaction record*: (1) from declared stock dividends to net transfer to surplus and (2) from capital stock back to earned surplus.

Net Transfer to Surplus

This final item must be washed out (adjustment 7) against the change in earned surplus, because they are one and the same; that is, the entire income account may be regarded as a series of charges and credits to the beginning earned surplus account.

II. Capital budget transactions

Plant expenditures

A. Conventional method

<i>Land, plant, equipment, and leasehold improvements</i>		
Closing balance, net of depreciation reserve	48,780	
Written-off to operations this year (depreciation)	3,103	
	<hr/>	
Total in hand during year	51,883	
Beginning balance, net of depreciation reserve	44,693	
	<hr/>	
Equals additions at cost, this year	7,190	
	<hr/> <hr/>	

B. Arithmetically

Closing minus beginning net balance	+4,087
Add depreciation	3,103
	<hr/>
Equals additions at cost	7,190
	<hr/> <hr/>

C. Adjustment method

	Transaction Record		Adjustments		Cash	
	Dr.	Cr.	Dr.	Cr.	Payments (Dr.)	Receipts (Cr.)
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Depreciation	3,103			3,103(8)		
Fixed assets (net)	4,087		3,103(8)		7,190	

The Analytical Mechanism for Fund-Flow Measurement

It will be noted that plant expenditures calculated as above fail to match those reported in Form 10K to the SEC. The difference is made up principally in the sale (disposal) of assets. Our figures fail to take note of monies received in such transactions and, as an arithmetic consequence, of equal amounts spent on plant. Our answer may be labeled the "net capitalized expenditure" (see note at end of Chapter 4).

All of the accounts which need adjusting to arrive at the final cash-flow figures have now been discussed. Unless more detail is required than is usually wanted, all the other accounts of the balance sheet enter the cash-flow column in their simple, net-change state. The completed product is given in Table A-2.

Adjustments to the Transaction Record for the Derivation of the Flow of Total Assets

The adjustments to the transaction record for the derivation of causes of the change in total assets are much less complicated than those for cash; hence, we need not repeat the conventional and arithmetic methods. And because capital budget transactions are mere conversions of existing assets, rather than additions to the sum total, we need consider, on the business side of the ledger, only operating transactions.

Operating Transactions						
<i>Revenue</i>	Transaction Record		Adjustments		Total Assets	
	Dr.	Cr.	Dr.	Cr.	Payments (Dr.)	Receipts (Cr.)
Sales and other income		329,260	299,915(1)			26,242
			3,103(2)			
Costs and other expenses	299,915			299,915(1)		
Depreciation	3,103			3,103(2)		

Costs and depreciation are adjusted to sales on the ground that management has exchanged inventory and some of the life of its plant for still another asset, sales revenue. In this particular case, the resulting net balance is net income before taxes and is the chief operating addition to total assets. The element "and other income" would have included dividends and interest, profit on the sale of assets, etc. Had the balance sheet shown "advances by customers" these would have been an additional source of assets obtained in operations.

The Analytical Mechanism for Fund-Flow Measurement

Assets supplied by vendors

	Transaction Record		Adjustments		Total Assets	
	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Payments</i> (<i>Dr.</i>)	<i>Receipts</i> (<i>Cr.</i>)
	(Vendors)				8,759(3)	
Accounts payable		8,759	8,759(3)			(vendors)

Whereas in the cash flow an increase in unpaid bills meant only that the cost of goods sold overstated the cash outlay, in the flow of total assets the interpretation is entirely different. Here is a true inflow of goods without a countervailing outflow of assets of any kind. Only when business turns downward and the rate of purchasing falls off will assets be diminished by the excess of payments over new credits.

Tax payments

	Transaction Record		Adjustments		Total Assets	
	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Payments</i> (<i>Dr.</i>)	<i>Receipts</i> (<i>Cr.</i>)
	Provision of reserve: federal income tax	10,800			7,435(4)	3,365
Reserve: federal income tax		7,435	7,435(4)			

Tax payments diminish total assets, and it is, consequently, necessary to derive the amount, as was done for cash.

Dividend payments in cash, kind, or stock of other companies diminish assets; and, in the absence of a current liability for dividends unpaid, the declaration in the transaction record goes unadjusted to the flow column. Again, the net transfer to surplus must be washed out (adjustment 5) against the change in surplus, because they are one and the same.

MONEY MARKET

Unless greater detail is wanted, the net changes in the money-market accounts, as displayed in the transaction record, may go unadjusted to the flow column. It will be noted that total assets are affected only by transactions in the company's debt or equity and that, therefore, the definition of the money market in the case of this fund excludes the trading in United States and other marketable securities that was allowed to the cash fund.

TABLE A-3
 WORKSHEET FOR DERIVING PAYMENTS AND RECEIPTS OF TOTAL ASSETS, ALLIS-CHALMERS MANUFACTURING COMPANY, 1948
 (thousands of dollars)

	Transaction Record		Adjustments		Total Assets		Change in Total Assets	
	Dr.	Cr.	Dr.	Cr.	Payments	Receipts	Dr.	Cr.
	(5)		(6)		(7)		(8)	
Sales and other income		329,260		299,915(1)		26,242		
Costs and other expenses	299,915		3,103(2)	299,915(1)				
Depreciation	3,103			3,103(2)				
Net profit	26,242			(Vendors) 8,759(3)		8,759		
Provisional reserve, federal income tax	10,800						3,365	
Dividends	5,193						5,193	
Net transfer to surplus	10,249			10,249(5)				
	329,260	329,260					(8,558)	(35,001)
								(26,443)

The Analytical Mechanism for Fund-Flow Measurement

Cash	7,537			7,537
U.S. and other securities	6,000			6,000
Trade receivables	17,461			17,461
Inventory	15,520			15,520
Other current assets	641			641
Investments and advances	0			0
Fixed assets (net)	4,087			4,087
Deferred charges	220			220
Other assets	23			23
Notes payable, short-term	15,000		15,000	
Accounts payable	8,759	8,759(3)		
Reserve: federal income tax	7,435	7,435(4)		
Term loan	10,000		10,000	
Bonds	0		0	
Preferred stock	0		0	
Common stock	0		0	
Earned surplus	10,249	10,249(5)		
	<u>51,466</u>	<u>329,461</u>	<u>329,461</u>	<u>51,466</u>
		<u>8,558</u>	<u>60,001</u>	<u>51,466</u>
			<u>51,443</u>	<u>51,443</u>

SOURCE: Table A-1. Figures in parentheses in column 6 are used to key text discussion of adjustments to table entries.

The Analytical Mechanism for Fund-Flow Measurement

The completed worksheet for the flow of total assets is given in Table A-3.

Adjustments to the Transaction Record for the Derivation of the Flow of Working Capital

The adjustments necessary for the derivation of the flow of working capital (current assets less current liabilities) are even simpler than those for total assets. Only two substantive adjustments need to be made (numbered adjustments refer to those of Table A-4).

Operating Transactions						
<i>Revenue</i>	Transaction Record		Adjustments		Working Capital	
	Dr.	Cr.	Dr.	Cr.	Payments (Dr.)	Receipts (Cr.)
Sales and other income		329,260	299,915(1)			29,345
Costs and other expenses	299,915			299,915(1)		
Depreciation	3,103			3,103(2)		
				(dr. to Plant)		

Costs and other expenses are adjusted to sales on the ground that a mere exchange of one kind of current asset for another has taken place. Depreciation, not being an expenditure of any current asset, but rather the sale of a part of the life of the plant, must be prevented from appearing in the outflow column. The residual revenue figure in this particular instance amounts to net income before taxes, plus depreciation. Had the deferred charges diminished, that is, had charges to sales exceeded new prepayments, then costs would be overstating the outlay of current assets and would have to be diminished accordingly. The residual revenue figure would then have been larger. Or, if some of the sales revenue had been in the form of long-term instalment contracts, it would have to be diminished by the increment in that noncurrent account.

Income Taxes

For working capital, it is the incurrence of liability for the payment of income taxes that reduces the amount of that fund that can be obtained from operations, and not the cash payments, as was true for the cash and the total-asset funds. Since the liability must be extinguished within the year, it becomes a charge against working capital at the moment of discovery. Therefore, the income tax, as incurred and reflected in the income

The Analytical Mechanism for Fund-Flow Measurement

account, must go unadjusted to the flow column as an outlay of working capital. The closing balance of the reserve account (given among the current liabilities) reports the unpaid balance, and its increment (or decrement) during the year need not correspond with the amount of liability incurred. It should be observed that the actual cash settlement, when it subsequently takes place, does not diminish the working capital.

Dividends

Dividends, excluding stock dividends, become a current liability and thus diminish working capital when declared, rather than, as in the cases of cash and total assets, when paid.

<i>Plant expenditures</i>	Capital Budget Transactions					
	Transaction Record				Working Capital	
	Transaction Record		Adjustments		Payments	Receipts
	Dr.	Cr.	Dr.	Cr.	(Dr.)	(Cr.)
Depreciation	3,103			3,103(2)		
Fixed assets (net)	4,087		3,103(2)		7,190	

Additional plant and equipment put in place eats up working capital, unless long-term instalment contracts are given in exchange. In the latter circumstance only the annual payments (or transfer of "current instalment of long-term contract due within the year" to the current-liability section of the balance sheet) constitute a drain upon working capital.

Deferred Charges

In working capital, as in the cash fund, we have lost sight of both the new prepayments, which cannot be charged to sales until the year in which the services are to be absorbed, and the absorption this year of services previously paid for. Considering only the net change in the account, we do not lose any of the amounts of the charges or prepayments themselves (because the charges, whatever their sum, are in the figure for the cost of goods sold); but we are unable, in the working-capital account, to make a proper allocation of sums between the operating and capital budgets. This dilemma has been avoided in the cash flow by assigning all transactions in the deferred-charge account to the operating budget. But for working capital, with whose traditions we may take no liberties, the rules for adjustment are different. A creditward movement of the account must be adjusted to costs, which would otherwise overstate the outlay of current assets. This adjustment will have the effect of increasing the residual

The Analytical Mechanism for Fund-Flow Measurement

revenue figure. But a debitward movement of the account is permitted to go unadjusted to the flow column as an outlay of working capital for a noncurrent asset, just as in the case of plant expenditures. Yet we know this net figure to be an understatement of the sums actually prepaid, as we know, also, that the costs overstate by the same amount.

Other Noncurrent Accounts

Other transactions which are clearly operating in origin, yet whose settlement dates lie beyond twelve months, give rise to noncurrent accounts that must be regarded as takers or suppliers of working capital in the operating rather than in the capital budget area. Examples are long-term receivables or payables. Ordinarily, changes in these accounts would be adjusted back to costs or revenue; but in order to leave net income and depreciation figures undisturbed, they have been entered under a separate heading and on a net basis.

MONEY-MARKET TRANSACTIONS

The working-capital account takes a more limited view of the money market than either the cash or total asset funds accounts, for it obliterates transactions both in marketable securities and in its own short-term obligations, because such dealings have no effect on its amount. Consequently, only transactions in the company's equity or long-term debt are taken into account.

The completed worksheet for the derivation of the flow of working capital is given in Table A-4.

ACQUISITION BY MERGER

Acquisition by merger or exchange of stock is the most difficult, if not impossible, transaction to handle in fund-flow analysis. If the take-over is total then the analyst has a reasonable opportunity for accuracy through deconsolidation or pro forma consolidation of the beginning balance sheets. But since only the common assets are under negotiation, the take-over may involve any sum ranging between common equity and total assets, depending on how the principals choose to liquidate the discontinuing company; and, hence, the (outside) analyst is left with ambiguous answers. In the special case of the total take-over, the procedures after deconsolidation would be as follows: For cash, derive the normal cash flow; for total assets, append another title, co-equal with operations and money-market obligations in Table 4, labeled "Acquisition by merger," and there enter the stated (book) value of common stock issued for the

The Analytical Mechanism for Fund-Flow Measurement

assets; on the worksheet (Table A-3) add a second line for common stock, labeled "merger," and a similar title at the foot of the listed assets; in the adjustment column credit the book value of the stock issued for the assets, and debit the asset-title "Merger."

The procedure for working capital is more complex. The amount of working capital gained in the transaction is debited in the adjustment column to an account of that title inserted at the end of the current assets and an equal amount is credited to "Common stock, merger." The non-current liabilities and assets taken over in the merger are ignored. It is worth a note in passing that it is next to impossible to make up a transaction record equally suitable for the requirements of all three funds. The requirement could be filled only by supplementary schedules.

Adjustments to the Transaction Record for the Derivation of the Flow of Purchase Funds

Only two adjustments to the transaction record are required for the purchase fund.

	Operating Transactions				Purchase Fund	
	Transaction Record		Adjustments		Payments	Receipts
	Dr.	Cr.	Dr.	Cr.	(Dr.)	(Cr.)
<i>Income account</i>						
Costs and other expenses	299,915		15,520(1)		315,439	
Depreciation	3,103			3,103(2)		
<i>Balance sheet</i>						
Inventory	15,520			15,520(1)		
Fixed assets, net	4,087		3,103(2)		7,190	

The change in inventory is transferred to costs and other expenses in order to accumulate in one place the goods taken in on current account, that is, in operations. Depreciation is removed from the operations category because, as part of existing plant, it represents a commodity taken in not this year but in a previous period. The amount is transferred to the change in net plant in order to calculate the new plant put in place this year.

In Table A-5, two fund-flow columns are shown, one reporting the total of goods and services transferred in or out, and the other, the transactions with the money market.

TABLE A-4
 WORKSHEET FOR DERIVING PAYMENTS AND RECEIPTS OF WORKING CAPITAL, ALLIS-CHALMERS MANUFACTURING COMPANY, 1948
 (thousands of dollars)

	Transaction Record		Adjustments		Working Capital		Change in Working Capital	
	Dr.	Cr.	Dr.	Cr.	Payments	Receipts	Dr.	Cr.
	(5)		(6)		(7)		(8)	
Sales and other income		329,260		299,915(1)			29,345	
Costs and other expenses	299,915			299,915(1)				
Depreciation	3,103			3,103(2)				
Net profit	26,242							
Provisional reserve, federal income tax	10,800					10,800		
Dividends	5,193					5,193		
Net transfer to surplus	10,249			10,249(3)				
	329,260	329,260				(15,993)	(29,345)	
								(13,352)

The Analytical Mechanism for Fund-Flow Measurement

Cash	7,537			7,537
U.S. and other securities	6,000			6,000
Trade receivables	17,461			17,461
Inventory	15,520			15,520
Other current assets	641			641
Investments and advances	0		0	
Fixed assets (net)	4,087		7,190	
Deferred charges	220		220	
Other assets	23		23	
		3,103(2)		
Notes payable, short-term	15,000			15,000
Accounts payable	8,759			8,759
Reserve: federal income tax	7,435			7,435
Term loan	10,000		10,000	
Bonds	0		0	
Preferred stock	0		0	
Common stock	0		0	
Earned surplus	10,249		10,249(3)	
	51,466	313,267	313,267	47,159
	51,466	313,267	313,267	31,194
				15,965
				15,965

Source: Table A-1. Figures in parentheses in column 6 are used to key text discussion of adjustments to entries.

TABLE A-5
 WORKSHEET FOR DERIVING PAYMENTS AND RECEIPTS OF PURCHASE FUNDS, ALLIS-CHALMERS MANUFACTURING COMPANY, 1948
 (thousands of dollars)

	Transaction Record		Adjustments		Transfer of Goods and Services				Money Market		Change in Purchase Fund	
	Dr.	Cr.	Dr.	Cr.	Payments	Receipts	Dr.	Cr.	Payments	Receipts	Dr.	Cr.
Sales and other income		329,260										
Costs and other expenses	299,915		15,520(1)				315,435					
Depreciation	3,103			3,103(2)								
Net profit	26,242											
Provisional reserve, federal income tax	10,800										10,800	
Dividends	5,193											15,442
Net transfer to surplus	10,249											
	329,260	329,260										

The Analytical Mechanism for Fund-Flow Measurement

Cash	7,537				7,537
U.S. and other securities	6,000			6,000	
Trade receivables	17,461				17,461
Inventory	15,520	(1)			641
Other current assets	641				
Investments and advances	0			0	
Fixed assets (net)	4,087		3,103	7,190	
Deferred charges	220				220
Other assets			23		23
Notes payable, short-term	15,000			15,000	
Accounts payable	8,759				8,759
Reserve: federal income tax	7,435				7,435
Notes payable, long-term	10,000			10,000	
Bonds	0			0	
Preferred stock	0			0	
Common stock	0			0	
Earned surplus	10,249				10,249
	<u>51,466</u>	<u>18,623</u>	<u>18,623</u>	<u>348,867</u>	<u>329,260</u>
	6,000	25,000	6,000	25,000	25,859
	<u>19,000</u>	<u>19,000</u>	<u>19,000</u>	<u>19,000</u>	<u>607</u>
					<u>26,466</u>

SOURCE: Table A-1, column 5. Figures in parentheses in second column are used to key text discussion of adjustments to entries.

The Analytical Mechanism for Fund-Flow Measurement

A brief tabular comparison of the principal transactions affecting the size of each fund is offered in Table A-6 in the belief that it may be helpful in visualizing directly the major differences between them. It will also serve to emphasize the rules that sources may not be named indiscriminately and that each fund has its own unique schedule of both sources and uses.

THE SHORT TRANSACTION RECORD

The foregoing analysis of transactions affecting cash, total assets, and working capital has been based on the total transactions undertaken by the company. Sometimes, however, the analyst may be forced, or may choose, to be satisfied with less than the full transaction record. His needs or his data may refer only to the balance-sheet changes and to selected items from the income account (the items usually selected from the income account are dividends, depreciation, and net profit after taxes). From these data a short transaction record may be prepared in a way corresponding to that already described. As a matter of fact, certain of our most valuable compilations of historical corporate data exist in this form. The Board of Governors of the Federal Reserve System published annually, in the *Federal Reserve Bulletin*, a table of the sources and uses of funds, prepared from the reports of approximately 300 corporations. The National Bureau of Economic Research, under its Financial Research Program, has prepared similar tables (extending, in some cases, back to 1914) which underlie many of its studies, including the following (all New York, NBER): C. H. Schmidt and R. A. Young, *The Effect of War on Business Financing: Manufacturing and Trade, World War I* (1943); C. L. Merwin, *Financing Small Corporations in Five Manufacturing Industries, 1926-36* (1942); Albert R. Koch, *The Financing of Large Corporations, 1920-39* (1943); Friedrich A. Lutz, *Corporate Cash Balances, 1914-43: Manufacturing and Trade* (1945); Sergei P. Dobrovolsky, *Corporate Income Retention, 1915-43* (1951).

The Department of Commerce also prepares such a table, which differs, however, from the others in coverage and method of compilation; estimates of national aggregates are used instead of aggregates of certain selected companies, and no adjustments are made which correspond to those described for column 4 (Chart A-1) in the preparation of the transaction record. The question naturally presents itself: To what extent may the less complete data be made to reproduce the information yielded by the full transaction record? The next section takes up that problem.

The Analytical Mechanism for Fund-Flow Measurement

TABLE A-6
COMPARISON OF THE PRINCIPAL TRANSACTIONS AFFECTING THE SIZE OF EACH FUND

	Cash	Total Assets	Working Capital	Purchase Fund
<i>Operations</i>				
From customers	Cash collections	Net income before tax	Net income before tax plus depreciation	Delivery of goods (sales)
To suppliers (cost of goods sold)	Cash payments	Change in accounts payable	None	Absorption of goods and services
To government (income tax)	Cash payments	Cash payments	Incurrence of liability for the whole tax	Incurrence of liability for the whole tax
To stockholders	Cash payments	Cash payments	Declaration	Net income after tax
<i>Capital budget</i>	Expenditures for plant, investments, and other long-term assets	None	Expenditures for plant, investments, and other long-term assets	Expenditures for plant
<i>Money market</i>	U.S. and market securities			U.S. and market securities
	Short-term notes	Short-term notes		Short-term notes
	Long-term notes, bonds	Long-term notes, bonds	Long-term notes, bonds	Long-term notes, bonds
	Preferred and common stock	Preferred and common stock	Preferred and common stock	Preferred and common stock

The Analytical Mechanism for Fund-Flow Measurement

DERIVATION OF FUND FLOWS FROM THE SHORT TRANSACTION RECORD

Cash

Following is a short transaction record (Table A-7) of the Allis-Chalmers Company for 1948, made from Table A-1 by omission of parts of the income account, and with net profit stated on an after-tax basis (i.e., omitting 000's, \$26,242 - \$10,800 = \$15,442).

The object now is to reproduce to the fullest possible extent, from the short record, the information contained in the statement of cash payments and receipts given earlier (Table 1). In the absence of sales and cost data, the kinds of adjustments which the full record permitted are pointless (Table A-2). One is obliged, therefore, to attempt the reconstruction by other means. Many of the blanks may be filled in directly: change in cash; money-market transactions; and all the nonoperating transactions (plant expenditures being calculated, as before, by adding the depreciation figure to the balance-sheet change). The statement would then appear as in Table A-8. Only the operating transactions, together with the totals depending on them, remain blank. But, by the use of a kind of accounting algebra, the net result of operations may be calculated² on the basis of

<i>Transaction Classification</i>	<i>Payments Dr.</i>	<i>or</i>	<i>Receipts Cr.</i>
Operating = x	()	<i>or</i>	()
Capital	\$7,167		
Financial			\$19,000
			<hr style="width: 50%; margin: 0 auto;"/>
Result			7,537

the following reasoning: Cash increased by only \$7,537,000, in spite of the net borrowing of \$19 million; therefore, there must have been business expenditures, in excess of receipts, amounting to \$11,463,000. Nonoperating expenditures accounted for \$7,167,000 of this sum; therefore, there were net expenditures in operations alone in the amount of \$4,296,000. This is the figure yielded by the full transaction record. Tables A-10 and A-11, giving the cash payments and receipts of large manufacturing corporations, have been prepared by this method.

The figure can also be reached by another method, sometimes called the adjusted income method. This is the method most frequently used,

² In algebraic terms, let x be the excess of expenditures or receipts in operations. Given (000's omitted):

The Analytical Mechanism for Fund-Flow Measurement

TABLE A-7
SHORT TRANSACTION RECORD, ALLIS-CHALMERS
MANUFACTURING COMPANY, 1948
(thousands of dollars)

	Short Trans- action Record (Net ^a)		Adjustments		Short Trans- action Record (Gross)	
	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
Depreciation				3,103		3,103
Net profit after taxes		15,442				15,442
Dividends	5,193				5,193	
Net transfer to surplus	10,249			10,249		
	<u>15,442</u>	<u>15,442</u>				
Cash	7,537				7,537	
U.S. and other securities	6,000				6,000	
Trade receivables	17,461				17,461	
Inventory	15,520				15,520	
Other current assets	641				641	
Investments and advances	0				0	
Fixed assets (net)	4,087		3,103		7,190	
Deferred charges	220				220	
Other assets		23				23
Notes payable, short-term		15,000				15,000
Accounts payable		8,759				8,759
Reserve: federal income tax		7,435				7,435
Term loan		10,000				10,000
Bonds		0				0
Preferred stock		0				0
Common stock		0				0
Earned surplus		10,249	10,249			
	<u>51,466</u>	<u>51,466</u>	<u>13,352</u>	<u>13,352</u>	<u>59,762</u>	<u>59,762</u>

^a From Table A-1, column 5, omitting parts of the income account.

The Analytical Mechanism for Fund-Flow Measurement

and in view of its sometimes ambiguous results, it may be well to review it with some care.

In Table A-2 certain adjustments were made to the full transaction record for the nonpayment or nonreceipt of cash. Because all the pertinent data were in full view, no uncertainty attended any adjustment; and there was, therefore, no call for discussion. The short transaction record is another matter. The principal accounts against which adjustments were entered in Table A-2 (sales, cost of goods sold, provision for taxes) simply do not exist in the short record given in Table A-7. Since it is hard to adjust figures which are not there, the adjustments are held in abeyance, momentarily, and then applied to the first income figure to appear. At this point, ambiguities may arise, because the income figure given may be the one "before tax" or "after tax." The system of noncash adjustments to income is orderly and reasonable, however, and may be seen in compact form if we return to the full record to observe particularly the adjustments (in the area of operations) which were required to transform the statement of income-and-condition into a cash statement.

Table A-9 shows in detail both the adjustments made to the full transaction record of Allis-Chalmers and the adjustments which would have to be made to income in the absence of sales and cost data. In descending order of inclusiveness, there are four points in the income account at which reporting may begin: with sales, if the full record is used; if not, then with net income (before provision for income tax); or with disposable income (net income after provision for income tax); or with retained income (net income after tax and dividends). In 1948, the figures in the income account overstate both receipts and payments of cash; at other times, they may understate either or both. If the full transaction record is used, starting off with the sales figure, then all adjustments for nonreceipt and nonpayment of cash may be made to the offending accounts directly. If a short form is used in which the first reporting figure is net income, then it, being in the same error as its predecessors, must be corrected in like amount. Thus, in the present case, sales overstated cash receipts by \$17,461,000, which lay in receivables, and costs overstated cash payments by \$3,103,000 (for depreciation). Hence, net income must be corrected (adjusted) by entering a credit of \$3,103,000 and a debit of \$17,461,000 to reveal the excess of cash received from customers over cash paid in this period for goods delivered to them. The amount of net receipts, \$11,884,000, is thus determined with equal accuracy whether the report begins with sales or drops down to net income. With net income as the first reporting figure, those transactions which lie below it will be adjusted directly and stated on a cash payment basis, i.e. tax payments, \$3,365,000; dividend payments, \$5,193,000.

If a still shorter transaction record is used, in which the first figure

The Analytical Mechanism for Fund-Flow Measurement

TABLE A-8

STATEMENT OF CASH PAYMENTS AND RECEIPTS BASED ON SHORT TRANSACTION
RECORD, ALLIS-CHALMERS MANUFACTURING COMPANY, 1948
(thousands of dollars)

	Cash	
	<i>Payments</i> <i>Dr.</i>	<i>Receipts</i> <i>Cr.</i>
<i>Business transactions</i>		
Operations budget		
Receipts from customers		
Production payments		
Income tax payments		
Dividends		
Subtotal	?	?
Subtotal difference	x = 4,296	
<i>Capital budget</i>		
Investments and advances	0	
Expenditures on plant	7,190	
Other nonoperating assets		23
Subtotal	7,190	23
Subtotal difference	7,167	
Total business transactions	?	?
Difference	11,463	
<i>Money-market transactions</i>		
U.S. and other marketable securities	6,000	
Notes payable, short-term		15,000
Term loan		10,000
Total money-market transactions	6,000	25,000
Difference		19,000
Total payments and total receipts	?	?
Effect on cash		7,537

SOURCE: Short record, Table A-7.

? = not available from short transaction record.

The Analytical Mechanism for Fund-Flow Measurement

TABLE A-9
 ADJUSTMENTS TO INCOME FOR DERIVATION OF CASH FLOW FROM SHORT TRANSACTION RECORD,
 ALLIS-CHALMERS MANUFACTURING COMPANY, 1948
 (thousands of dollars)

	Transaction Record		Adjustments to Costs for Nonpayment		Adjustments to Sales for Noncollection		Net Effect of Transactions on Cash (successively)
	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	
<i>Operations</i>							
Income account		329,260				17,461	
Sales							
Cost of goods sold:							
Purchases	299,915			3,103			
Depreciation	3,103						
Net income		26,242					cr. 11,884
Provisional tax reserve	10,800					7,435	
Disposable income		15,442					
Dividends	5,193						cr. 8,519
Retained income (transfer to surplus)		10,249					cr. 3,326

The Analytical Mechanism for Fund-Flow Measurement

Balance sheet		
Inventory	15,520	
Other current assets	641	
Deferred charges	220	
	16,381	
<i>Total operations</i>		4,296
	<i>dr.</i>	

SOURCE: Table A-2, column 3.

^a Subtotal for balance-sheet group only, *dr.* \$7,622.

The Analytical Mechanism for Fund-Flow Measurement

reported is disposable income (net after taxes), \$15,442,000, this figure must be adjusted not only for depreciation and receivables as before, but also for the unpaid balance of the \$10,800,000 income tax charged against income immediately above. The complete record shows that \$7,435,000, reflected in the transaction record as an increase in tax liability, was the difference between the charge to income and the actual payment. To yield the net effect upon cash of all of the transactions lying above it, disposable income must be corrected by the same adjustments that were made in the case of the full record, namely, by entering credits of \$7,435,000 and \$3,103,000, and a debit of \$17,461,000, which results in a net figure of \$8,519,000. In short, if the first reported figure is net income, tax payments may be calculated directly; but if receipts are understated by the amount of tax incurrence, the understatement must be corrected if the short form that begins with disposable income is to provide the same answer as the full record.

Finally, if the first figure reported in a short transaction record is retained income (net after taxes and dividends), \$10,249,000, this, too, must be corrected for all of the nonmovements of cash in all of the transactions lying above it. In the present case there are no adjustments in addition to those which applied to disposable income, and the net effect upon cash at this stage of reporting is a credit of \$3,326,000 for both the long and the short record. If, however, there had been an admitted though unpaid liability on account of dividend declarations, the situation would be like that of the admitted though unpaid tax liability and should be handled accordingly.

It will have been observed that the arrangement of account titles in Table A-9 differs somewhat from that in Tables A-8 and 1, where all purchases for current account were brought into the statement of operations, from which a single net figure emerged showing the net gain or loss of cash (in the present case, a loss of \$4,296,000). Table A-9, conventionally splitting operating transactions into those having to do with goods sold and those concerning goods not sold, shows net cash gained in sales, \$3,326,000, and net cash invested in additional operating assets, \$7,622,000, the combined effect of which is the net outlay of \$4,296,000. The last adjustment for operating transactions in Table A-9 is \$8,759,000, for not paying vendors the full amount purchased from them in building up inventory. If we had before us the exact amount of prepaid insurance, etc., charged to income in this period, production payments would be corrected for that also. The inclusion of forward payments for insurance, etc., as operating transactions is based on their usual appearance in the operating budget and would not be further defended.

The Analytical Mechanism for Fund-Flow Measurement

This closes the presentation of the adjusted income method of deriving the gain or loss of cash in operations from three forms of short transaction record according to the character of the first figure given. After similar examination of the short records with respect to total assets and to working capital, some comments will be made on the utility of the various procedures.

Total Assets

Again using the short transaction record given in Table A-7, we can reconstruct almost all the transactions which affected total assets as given in Table 4, based upon the full record. Total assets increased by \$51,443,000. Of this amount \$25 million was obtained from the money market. Therefore, \$26,443,000 came from operations. This leaves the problem of filling in the blanks of the operations statement. The full record yielded the following (ooo's omitted):

	Payments <i>Dr.</i>	Receipts <i>Cr.</i>
<i>Operations</i>		
Net income before taxes		\$26,242
Vendors		8,759
Tax payment	\$3,365	
Dividend payment	5,193	
		<hr/>
Net		26,443
<i>Money-market obligations</i>		25,000
		<hr/>
Total increase in assets		<u>51,443</u>

From the short record, the dividend and vendor items may be filled in; but the taxable net income and tax payments are missing. This deficiency might be overcome by calculations based on an assumption either (1) that the closing statement of tax liability equals the provision of reserve for income taxes for the reporting period, or (2) that tax payments in the reporting period equal the tax liability with which the company entered the period. But experience denies the reliability of these assumptions, and the present record is a case in point. Information on taxable net income is lacking in a surprising number of instances, especially before the forties. And because of this too frequent absence of information, taxes and income are often handled on a net basis, advantage being taken in the following equation of the arithmetic equivalence of the two sets of figures (ooo's omitted):

The Analytical Mechanism for Fund-Flow Measurement

$$\left. \begin{array}{l} \text{Taxable net income} \\ - \text{tax payments} \end{array} \right\} = \left\{ \begin{array}{l} \text{Net income after taxes} \\ + \text{net change in tax liability} \end{array} \right.$$

$$\begin{array}{l} \text{Substituting: } \$26,242 - \$3,365 = \$15,442 + \$7,435 \\ \qquad \qquad \qquad = \$22,877 \qquad \qquad \qquad = \$22,877 \end{array}$$

From Table A-9 and our discussion of the adjusted income method of deriving fund flows, it is clear that if sales revenue is offset by the cost of goods shipped, the residual net income, \$26,242,000, is the only addition to assets in these transactions. But if the first figure reported in the transaction record is disposable income, \$15,442,000, this understates the addition by \$10,800,000 and so must be corrected by cr. \$7,435,000 (tax incurrence, \$10,800,000, less tax payments, \$3,365,000) to bring the short record into agreement with the complete record at this net-income-minus-tax-payments stage in the analysis of total asset receipts. The statement of transactions affecting total assets, based on a short transaction record beginning with disposable income, therefore becomes (ooo's omitted):

	Payments <i>Dr.</i>	Receipts <i>Cr.</i>
<i>Operations</i>		
Net income less tax payments		\$22,877
Vendors		8,759
Dividend payment	\$5,193	
Net		26,443
<i>Money-market obligations</i>		25,000
Total increase in assets		51,443

This statement almost reproduces the earlier one based on the full record, failing that goal in both receipts and payments by \$3,365,000, the amount of taxes paid.³ If the short transaction record had begun with net income, then the long and short records would have yielded identical answers.

Working Capital

Nearly all of the transactions affecting working capital, as reported in Table 6 based on the long transaction record, may be derived from the short record as given in Table A-7. Had net income before taxes been recorded in Table A-7, then again, as in the case of total assets, all of the transactions for working capital could have been derived. After the blanks

³ The failure is not consistent, however, from year to year. In those years in which the provision of reserve for income taxes is smaller than in the preceding year, the extent of the failure equals the provision for taxes, rather than the tax payments.

The Analytical Mechanism for Fund-Flow Measurement

of the working-capital statement have been filled in from the figures given in the short record, it may be learned that working capital increased by \$15,965,000, and that two of the items leading to this result were non-operating expenditures of \$7,387,000 and net receipts of \$10 million from the money market. Therefore, operations must have added \$13,352,000 (i.e., with 000's omitted: $\$13,352 - \$7,387 + \$10,000 = \$15,965$). The task now is to fill in the blanks for operations. As reported in the full statement, receipts from customers were \$29,345,000; this amount is an aggregate of net income before taxes, \$26,242,000, and depreciation charges, \$3,103,000. The liability incurred on tax account was \$10,800,000. If the short record corresponds to Table A-9, with net income given on an after-tax basis, tax and income data will be lacking, and a net figure must be employed instead. The information yielded by the long and the short records will then compare as follows (000's omitted):

	Full Record		Short Record	
	<i>Payments</i> (Dr.)	<i>Receipts</i> (Cr.)	<i>Payments</i> (Dr.)	<i>Receipts</i> (Cr.)
<i>Operations</i>				
Net income before taxes		\$26,242		
Tax liability incurred	\$10,800			
				\$15,442
Depreciation		3,103		3,103
Dividends	5,193		\$5,193	
Subtotals	15,993	29,345	5,193	18,545
Net		13,352		13,352

The unique feature of working capital, when compared with total assets on the basis of payments and receipts, is the appearance in the receipts column of an amount corresponding to the depreciation charge, not only in the short statement which is based partially on calculations, but also in the statement based on the full report of transactions. This singularity requires comment. In making up the bill which the customer is asked to pay, all of the goods and services entering the product are listed. All of these are goods and services currently absorbed: that is, the service of employees, money lenders, entrepreneurs; the service of insurance, transportation, and advertising companies, publishers, and radio networks; also, materials, supplies, fuel, and the portion of its life which plant is estimated to have given to the product in the current period. Most of these

The Analytical Mechanism for Fund-Flow Measurement

things are paid for as absorbed. Some of them are not settled for until later, however; and the moment that the asset is entered among the current assets, its unpaid bill is entered among the current liabilities. Some, on the contrary, are paid for in advance, such as insurance and plant. When and as the services of these assets are absorbed, they are transferred out of noncurrent assets to current assets, being charged either to inventory or to sales. In this way they add to working capital and in this sense are sources of working capital uniquely. Thus, in the operating area only, profit and the transfer of previously existing noncurrent assets increase working capital; and if the author always makes clear beforehand that he is discussing the sources of working capital, no confusion may arise when he adds depreciation to net profit as a source of funds from operations. If, on the other hand, he is considering the sources of funds for increasing total assets, depreciation will not be present. Finally, if he is referring to the sources of cash, he will concentrate on sales and on the amount of cash actually received from customers.

RELATIVE UTILITY OF THE SHORT AND LONG RECORDS

Although the choice of means will always depend on specific research objectives and cannot be settled independently of them, some general comments may be offered on the appropriateness of the long and the short records to several types of problems.

A factor not associated with utility, but nevertheless high-ranking in the matter of choice, is relative cost. For problems involving the statement of income-and-condition of individual companies, the difference in cost between the full and the short transaction record is negligible. The major time consumed in any such study goes into preparation of the transaction record itself; and for this preparation exactly the same adjustments are required for the short as for the long record, the difference in cost coming from the few additional figures which must be transcribed from the income account. Of course, one cannot transcribe the full income account unless it is reported; and it is surprising how often full accounts were omitted in the past. Thus, in investigations where a fair sampling of companies in several industries has been needed for historical study of fund flows, to make a full record one of the conditions for inclusion would have amounted to giving up the study. For a representative sample of listed companies, no study requiring a full report should attempt to go farther back than 1936.

Appraisal of the utility of the long and short transaction records is best made in terms of each fund separately. The end product of fund-flow analysis in each case is the registration of transactions by which a specific

The Analytical Mechanism for Fund-Flow Measurement

quantity (e.g. working capital) was augmented and diminished in a given period. In the case of total assets, the long record and the pretax short record registered identical information. Therefore, most investigations dealing historically with the sources and uses of this fund might just as well employ the short record beginning with taxable income. As for the tax angle, no one can say without reference to a specific project whether it is important or not. Certainly, any problem involving taxes requires the pretax report. The after-tax report merely pretends that between, and not including, two dates a sum of money was neither received as profit nor paid out as taxes. Thus, for periods during which tax rates or income (or both) increase, no tax payments are registered; while on the downswing, payments are reported, but only in the amount of the decrement of the tax liability. For historical studies limited to periods when income taxes were relatively small (and generally not reported anyway), the omission is unimportant. But for recent periods, I doubt that any study of the financing of corporate growth should disregard either taxable net income or the annual outflow of assets to the government.

With respect to working capital, the long and the pretax short transaction records yield identical data. Hence, most historical studies concerned with the sources and disposition of working capital need not go above the taxable income figure. The points stressed in the preceding paragraph concerning after-tax reports apply with equal force to this fund, except that the working-capital fund never registers tax payments but only the incurrence of tax liability.

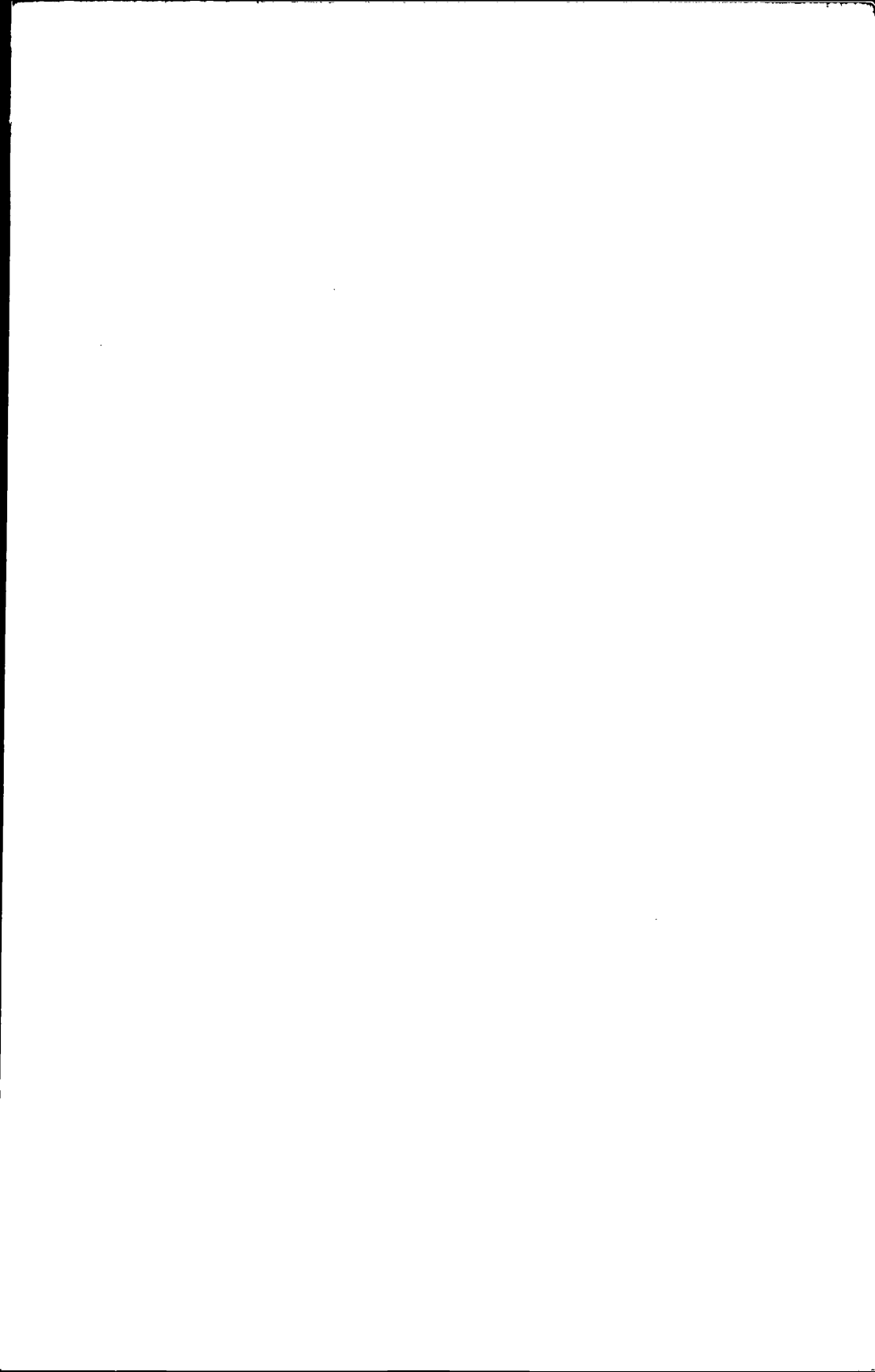
Although the short record will serve as well as the long for purposes of most historical studies concerned with the ebb and flow of total assets and of working capital, the problems of projection introduce new requirements. What will be the demand upon the money market by industrial corporations next year? For this problem, the target balance sheet must be calculated; and here the estimating error is likely to be minimized if the historical relationships between the full income account and the balance sheet are employed.

The relative utility of the long and short transaction records in dealing with the flow of cash is more difficult to discuss. Cash is exclusively the treasurer's field; and while total assets and working capital are important channel markers for his guidance, he cannot maintain solvency with them but only with cash. Many studies in finance take notice of the treasurer only when he leaves his office for the money market. Some focus on the extent to which he can avoid the money market. Behind such events, however, is the driving force of expenditures; and it is the matter of how completely these are to be revealed that must determine whether the long or the short transaction record should be used. Each registers money-market

The Analytical Mechanism for Fund-Flow Measurement

and capital budget transactions with equal fidelity; but of operating transactions, the short record gives only the stump, the net result. While this allows the analyst to be quantitatively precise in assigning money-market actions either to operations or to fixed assets, it does pull the curtain over sales and purchases. Yet these, in my mind, are the prime movers of the whole enterprise, shaping the expenditure patterns for all of the earning assets (thus conditioning the methods of financing) and, being responsive to business weather, heralding changes in the channels of flow.

Up to this point, our discussion of the relative utility of the two records has concerned problems which focus upon the corporation entirely apart from the social organization in which it is a very active member. In recent years, several economists have given their attention to social accounting, a discipline growing out of traditional stock-flow concepts and looking toward the perfection of income-and-condition reports for each of the several sectors of the national economy—income recipient, financial, producer, etc. A few economists, using such income-and-condition reports, have gone on to trace the flow of funds between the several sectors. In studies of the flow of goods and the counterflow of funds, where national product and consumption are the governing forces, emphasis is given to total transactions; and for this purpose, of course, the full transaction record is required.



The Analytical Mechanism for Fund-Flow Measurement

TABLE
PAYMENTS AND RECEIPTS OF CASH, EIGHTY-FOUR
(millions)

	1921		1922		1923	
	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>
<i>Business transactions</i>						
Operating budget						
Receipts from customers						
Production payments						
Income tax payments						
Cash lost or gained in operations		1,144		1,011		1,139
Dividends	380		402		499	
Subtotals	<u>380</u>	<u>1,144</u>	<u>402</u>	<u>1,011</u>	<u>499</u>	<u>1,139</u>
Subtotal difference		<u>764</u>		<u>609</u>		<u>640</u>
Capital budget						
Investments and advances	192		69		290	
Expenditures on plant	410		374		575	
Other nonoperating assets	7			3	7	
Subtotals	<u>609</u>	<u>0</u>	<u>443</u>	<u>3</u>	<u>872</u>	<u>0</u>
Subtotal difference	<u>609</u>		<u>440</u>		<u>872</u>	
Total business transactions	<u>989</u>	<u>1,144</u>	<u>845</u>	<u>1,014</u>	<u>1,371</u>	<u>1,139</u>
Difference		<u>155</u>		<u>169</u>		<u>232</u>
<i>Money-market transactions</i>						
U.S. and other marketable securities	107		25		29	
Notes payable, short-term	319		161			21
Long-term debt		146	108			32
Preferred stock		17		87		27
Common stock		110		73		239
Total money-market transactions	<u>426</u>	<u>273</u>	<u>294</u>	<u>160</u>	<u>29</u>	<u>319</u>
Difference	<u>153</u>		<u>134</u>			<u>290</u>
Total payments and total receipts	<u>1,415</u>	<u>1,417</u>	<u>1,139</u>	<u>1,174</u>	<u>1,400</u>	<u>1,458</u>
Effect on cash		<u>2</u>		<u>35</u>		<u>58</u>

The Analytical Mechanism for Fund-Flow Measurement

A-10

LARGE MANUFACTURING CORPORATIONS, 1921-39
of dollars)

1924		1925		1926		1927		1928	
Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
	1,328		1,520		1,774		1,897		2,141
527		614		764		840		905	
527	1,328	614	1,520	764	1,774	840	1,897	905	2,141
	<u>801</u>		<u>906</u>		<u>1,010</u>		<u>1,057</u>		<u>1,236</u>
61		189		192		113		224	
505		636		890		944		794	
2		3		10		33		14	
568	0	828	0	1,092	0	1,090	0	1,032	0
568		828		1,092		1,090		1,032	
1,095	1,328	1,442	1,520	1,856	1,774	1,930	1,897	1,937	2,141
	<u>233</u>		<u>78</u>		<u>82</u>		<u>33</u>		<u>204</u>
47		49		180		46		151	
119		45		23		13			20
45			3		87		203	20	
	3	28			37	129		8	
	57		143		159		94		115
211	60	122	146	203	283	188	297	179	135
151		24		80		109		44	
1,306	1,388	1,564	1,666	2,059	2,057	2,118	2,194	2,116	2,276
	<u>82</u>		<u>102</u>		<u>2</u>		<u>76</u>		<u>160</u>

The Analytical Mechanism for Fund-Flow Measurement

TABLE A-10

	1929		1930		1931	
	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>
<i>Business transactions</i>						
Operating budget						
Receipts from customers						
Production payments						
Income tax payments						
Cash lost or gained in operations		2,146		2,131		1,360
Dividends	1,012		972		810	
Subtotals	1,012	2,146	972	2,131	810	1,360
Subtotal difference		1,134		1,159		550
Capital budget						
Investments and advances	586		291		183	
Expenditures on plant	1,135		1,037		413	
Other nonoperating assets	63		22			3
Subtotals	1,784	0	1,350	0	596	3
Subtotal difference	1,784		1,350		593	
Total business transactions	2,796	2,146	2,322	2,131	1,406	1,363
Difference	650		191		43	
<i>Money-market transactions</i>						
U.S. and other marketable securities		19		204		139
Notes payable, short-term	15		109			28
Long-term debt	381			79		41
Preferred stock		68	10			21
Common stock		890		146		126
Total money-market transactions	396	977	119	429	229	126
Difference		581		310		103
Total payments and total receipts	3,192	3,123	2,441	2,560	1,635	1,489
Effect on cash	69			119		146

The Analytical Mechanism for Fund-Flow Measurement

(Continued)

1932		1933		1934		1935		1936	
<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>
	940		845		853		1,316		1,730
497		384		440		515		922	
497	940	384	845	440	853	515	1,316	922	1,730
	443		461		413		801		808
54		98		53		39		36	
365		307		483		584		804	
	5	6			13		4	15	
419	5	411	0	536	13	623	4	855	0
414		411		523		619		855	
916	945	795	845	976	866	1,138	1,320	1,777	1,730
	29		50	110			182	47	
8	225	118			184		106		84
8		30			64		63	4	
55		156		118		122		63	
51		8			81	62		143	
		22		15			21		143
122	225	282	52	133	329	184	190	210	227
	103	230			196		6		17
1,038	1,170	1,077	897	1,109	1,195	1,322	1,510	1,987	1,957
	132	180			86		188	30	

TABLE A-10 (Concluded)

	1937		1938		1939	
	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
<i>Business transactions</i>						
Operating budget						
Receipts from customers						
Production payments						
Income tax payments						
Cash lost or gained in operations		1,559		1,559		1,856
Dividends	1,019		562		750	
Subtotals	1,019	1,559	562	1,559	750	1,856
Subtotal difference		540		997		1,106
Capital budget						
Investments and advances	47		50		95	
Expenditures on plant	1,205		692		660	
Other nonoperating assets		6	8		3	
Subtotals	1,252	6	750	0	758	0
Subtotal difference	1,246		750		758	
Total business transactions	2,271	1,565	1,312	1,559	1,508	1,856
Difference	706			247		348
<i>Money-market transactions</i>						
U.S. and other marketable securities		26		38		123
Notes payable, short-term		95	146			55
Long-term debt		174		337		24
Preferred stock		97	2		6	
Common stock		150		13		20
Total money-market transactions	0	542	148	388	184	44
Difference		542		240		140
Total payments and total receipts	2,271	2,107	1,460	1,947	1,692	1,900
Effect on cash	164			487		208

SOURCE: NBER sample of eighty-four large manufacturing corporations. For its composition, see Chapter 1. Payments are entered in debit column; receipts, in credit column.

TABLE A-11

PAYMENTS AND RECEIPTS OF CASH, 198 LARGE MANUFACTURING CORPORATIONS,
1939-56
(dollars in millions)

	1939		1940		1941	
	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>
UNITED STATES SECURITIES AND RESERVE FOR INCOME TAXES STATED GROSS						
<i>Business transactions</i>						
Operating budget						
Receipts from customers					825	
Production payments			283			
Income tax payments	174		1,268		1,383	
Dividends	1,100					
Net cash from operations		1,714		2,196		2,394
Capital budget						
Plant expenditures	1,067		1,414		1,903	
Investments and other assets	135		68		52	
Subtotals						
Subtotal difference	1,202		1,482		1,955	
Total business transactions, net		512		714		433
<i>Money-market transactions</i>						
U.S. securities	86		23		944	
Notes to banks, short-term	61			6		225
Term loans		37		117		148
Bonds and mortgages	39		66			18
Stock, common and preferred	26		57		33	
Subtotals	212	37	146	123	977	391
Subtotal difference	175		23		586	
Effect on cash		337		691	147	
RESERVE FOR INCOME TAXES STATED NET OF UNITED STATES SECURITIES HELD						
Income tax payments	294		441		1,769	
Dividends	1,100		1,268		1,383	
Net cash from operations		1,594		2,038		1,450
Capital budget, net	1,202		1,482		1,955	
Total business, net		392		556	505	
<i>Money-market transactions</i>						
U.S. securities		34		135		0
Notes to banks, short-term	61			6		225
Term loans		37		117		148
Bonds and mortgages	39		66			18
Stock, common and preferred	26		57		33	
Subtotals	126	71	123	258	33	391
Subtotal difference	55			135		358
Effect on cash		337		691	147	

TABLE A-11

	1942		1943		1944	
	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>
UNITED STATES SECURITIES AND RESERVE						
<i>Business transactions</i>						
Operating budget						
Receipts from customers						
Production payments						
Income tax payments	2,064		2,745		3,946	
Dividends	1,152		1,190		1,307	
Net cash from operations		2,929		3,404		2,299
Capital budget						
Plant expenditures	1,473		1,413		1,570	
Investments and other assets	57			69		34
Subtotals						
Subtotal difference	1,530		1,344		1,536	
Total business transactions, net		1,399		2,060		763
<i>Money-market transactions</i>						
U.S. securities	1,109		1,374		780	
Notes to banks, short-term		86		10		173
Term loans		47		19		108
Bonds and mortgages		196	30			140
Stock, common and preferred		33		24		68
Subtotals	1,109	362	1,404	53	1,028	241
Subtotal difference	747		1,351		787	
Effect on cash		652		709		24
RESERVE FOR INCOME TAXES STATED						
Income tax payments	3,173		4,119		3,920	
Dividends	1,152					
Net cash from operations		1,820		2,030		2,325
Capital budget, net	1,530		1,344		1,536	
Total business, net		290		686		789
<i>Money-market transactions</i>						
U.S. securities		0		0		806
Notes to banks, short-term		86		10		173
Term loans		47		19		108
Bonds and mortgages		196	30			140
Stock, common and preferred		33		24		68
Subtotals		362	30	53	1,054	241
Subtotal difference		362		23		813
Effect on cash		652		709		24

(Continued)

1945		1946		1947		1948		1949	
Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
FOR INCOME TAXES STATED GROSS									
3,551		1,700		1,094		2,031		2,754	
1,322		1,418		1,774		2,115		2,378	
	1,782		671		3,273		4,547		5,514
1,873		3,264		4,301		4,792		3,921	
69		108		148		270		103	
1,942		3,372		4,449		5,062		4,024	
160		2,701		1,176		515		1,490	
152	311	84	1,490	139	160	598	104	1,129	
	97		176		270		75	223	
317			635		855		710	130	
	47		336		334		181		87
469	455	84	2,637	139	1,619	598	1,070	1,482	203
14			2,553		1,480		472	1,279	
174		148			304	43			211
NET OF UNITED STATES SECURITIES HELD									
1,792		1,114		2,049		2,716		2,389	
1,322		1,418		1,774		2,115		2,378	
	3,541		1,257		2,318		3,862		5,879
1,942		3,372		4,449		5,062		4,024	
	1,599		2,115		2,131		1,200		1,855
1,448			904		816		87	1,494	
152		84			160		104	223	
	97		176		270		75	130	
317			635		855		710		87
	47		336		334		181		116
1,917	144	84	2,051		2,435		1,157	1,847	203
1,773			1,967		2,435		1,157	1,644	
174		148			304	43			211

TABLE A-11

	1950		1951		1952	
	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>	<i>Dr.</i>	<i>Cr.</i>
UNITED STATES SECURITIES AND RESERVE						
<i>Business transactions</i>						
Operating budget						
Receipts from customers						
Production payments						
Income tax payments	2,314		4,459		6,247	
Dividends	3,047		2,905		2,984	
Net cash from operations		6,542		4,260		3,507
Capital budget						
Plant expenditures	3,738		5,656		6,725	
Investment and other assets	215		335		269	
Subtotals						
Subtotal difference	3,953		5,991		6,994	
Total business transactions, net		2,589		1,731		3,487
<i>Money-market transactions</i>						
U.S. securities	2,037		216			887
Notes to banks, short-term		7		723		107
Term loans	122			76		525
Bonds and mortgages	138			871		1,788
Stock, common and preferred		20		279		303
Subtotal	2,297	27	216	1,949		3,610
Subtotal difference	2,270			1,733		3,610
Effect on cash		319		2		123
RESERVE FOR INCOME TAXES STATED						
Income tax payments	4,634		6,333		4,955	
Dividends	3,047		2,905		2,984	
Net cash from operations		4,222		2,386		4,799
Capital budget, net	3,953		5,991		6,994	
Total business, net		269		3,605		2,195
<i>Money-market transactions</i>						
U.S. securities		283		1,658		405
Notes to banks, short-term		7		723		107
Term loans	122			76		525
Bonds and mortgages	138			871		1,788
Stock, common and preferred		20		279		303
Subtotals	260	310		3,607	405	2,723
Subtotal difference		50		3,607		2,318
Effect on cash		319		2		123

SOURCE: Federal Reserve Board; for details of composition of sample, see Chapter 1. column; receipts, in credit column.

(Concluded)

1953		1954		1955		1956	
Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
FOR INCOME TAXES STATED GROSS							
4,890		5,537		4,393		6,228	
3,089		3,363		3,995		4,284	
	<u>7,035</u>		<u>6,542</u>		<u>9,097</u>		<u>5,423</u>
6,805		6,853		7,051		9,730	
27		297		496		651	
6,832		7,150		7,547		10,381	
	<u>203</u>	<u>608</u>			<u>1,550</u>	<u>4,958</u>	
738			276	2,517			2,627
121		402		44			371
252		361			119		273
	792		1,026		411		1,227
	102		271		601		518
1,111	894	763	1,573	2,561	1,131		5,006
217			810	1,430			5,006
<u>4</u>		<u>202</u>					<u>48</u>
=		=					=
NET OF UNITED STATES SECURITIES HELD							
5,672		4,035		5,881		5,337	
3,089		3,363		3,995		4,284	
	<u>6,253</u>		<u>8,044</u>		<u>7,609</u>		<u>6,313</u>
6,832		7,150		7,547		10,381	
579			894		62		4,068
	54	1,226		1,029			1,727
121		402		44			371
252		361			119		273
	792		1,026		411		1,227
	102		271		601		518
373	948	1,989	1,297	1,073	1,131		4,116
	<u>575</u>	<u>692</u>			<u>58</u>		<u>4,116</u>
4			202		120		48
=		=			=		=

See especially discussion of reserve for taxes, pp. 11-12 ff. Payments are entered in debit