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Income Flow Analysis: A Management Tool

Robert S. Lynch

Funds flow analysis is pretty well understood and is, of course, vital in identifying shifts in balance sheet accounts. Surprisingly neglected, though, is income flow analysis, which is equally important —

INCOME FLOW ANALYSIS: A MANAGEMENT TOOL

by Robert S. Lynch

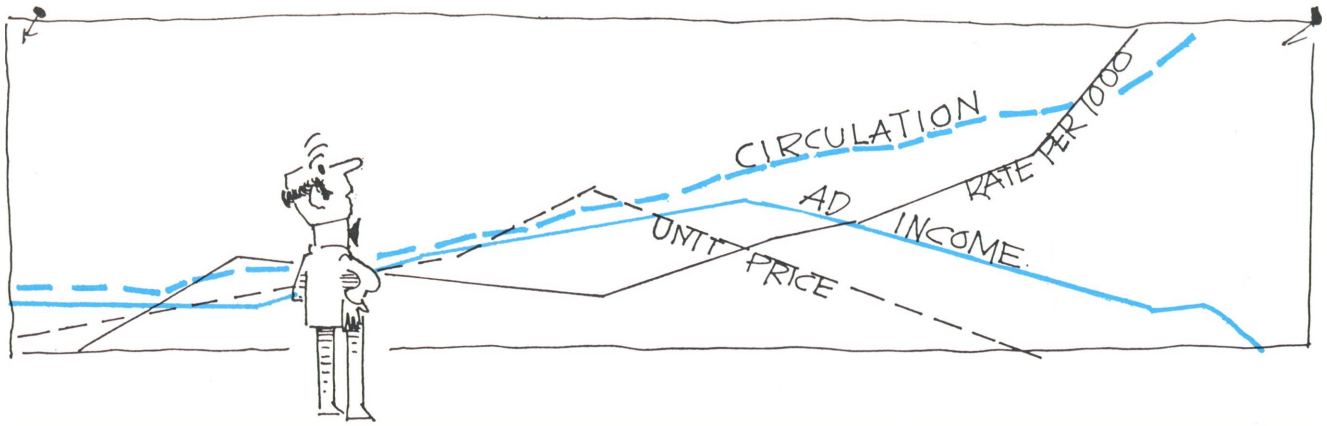
Aileen, Inc.

MANAGEMENT has spent a great deal of time and energy developing methods to evaluate the asset and financial structure of the firm. Ratio analysis and the statement of sources and applications of funds provide the executive with a wealth of data about the financial position of the enterprise. During a period when great strides have been made in balance sheet analysis, somewhat less attention has been paid to the income statement. Return on equity, return on investment, and profit margin ratios have been developed to aid management, but these seem to be the extent of the decision-making aids in the area of income analysis. For this reason, management should consider the value of income flow analysis which has been developed by an investment service.*

Income flow analysis (statement of sources of change in income) is similar to funds flow analysis (statement of sources and uses of funds) in its design. The purpose of income flow analysis is to translate two static income statements into a dynamic statement of the factors which affect reported net income after taxes (NIAT). Like funds flow, income flow analysis is a comparative process which identifies movements on the financial statement; but the comparison ends there. Funds flow analysis is primarily interested in identifying shifts in balance sheet accounts while income flow analysis is concerned with identifying those factors which altered net income. Furthermore, funds flow analysis identifies the sources and uses of funds (working capital), while income flow analysis identifies and determines the magnitude of the positive and negative influences on net income.

The final difference between funds flow and income flow analysis deserves special attention. Funds flow considers the absolute dollar change between two periods whereas income flow considers the change in any expense or revenue margin (as a per cent of sales) between two successive periods. Also

*—The statement of sources and changes in income (see Exhibit 2, pages 32-33) is part of financial analysis found in *Financial Dynamics*, a service of Investor Management Services, Inc., a division of Standard and Poor's Inc., Denver.



A hike in advertising page rates may negate itself in the profit picture because less pages are bought . . .

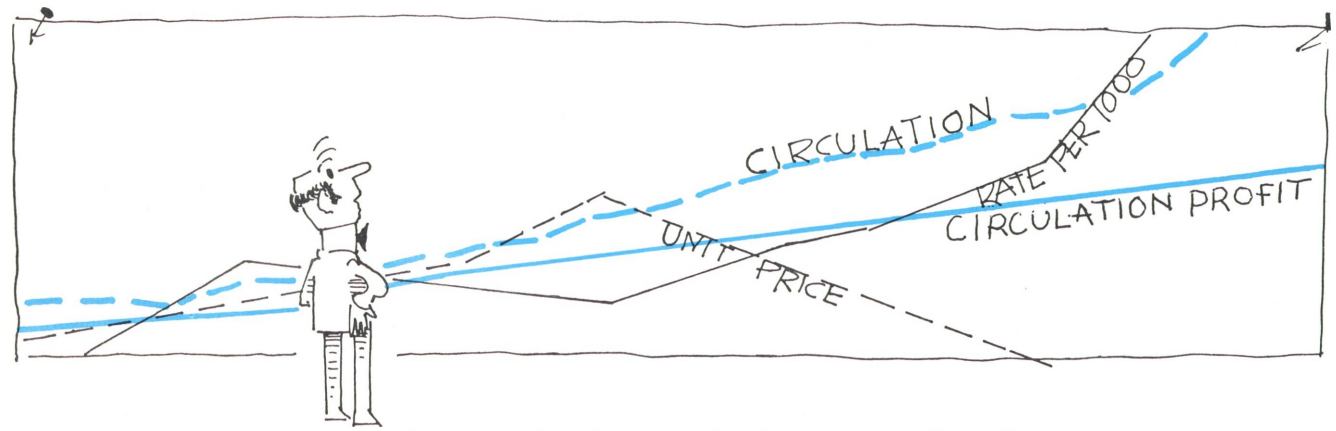
the revenue stream itself can be analyzed with a variance analysis approach.

Consider the situation of XYZ Publishing Company. (The following figures are obviously unreal, as anyone familiar with business will recognize; the true figures would be too apt to betray the real publication used in this instance. I could have multiplied the figures by an impossibly large number but then the tax calculations would have been altered. So I have chosen dummy figures which will seem completely unreal to most businessmen. The principle remains valid though.) Net income after taxes has improved from $12 to $15 during Period B (see Exhibit 1 on page 32). Management is more interested in determining ways which will further improve net income during Period C. Company records show that the number of subscribers grew from 100 to 200 but that the average subscription price fell from $.50 to $.375. The company's records also show that the number of advertising pages fell from 2,000 to 1,667 while the advertising rate jumped from $.025 to $.03 in Period B. The remainder of the categories are self-explanatory except for the fact that XYZ Publishing Company has a policy of maintaining no work-in-process or finished goods inventory.

What did we do right?

Management knows that net income grew by $3, but it is more concerned with what it did right and where it went wrong. The statement of sources, as outlined in Exhibit 2 on pages 32-33, provides this needed information. The revenues of the XYZ Publishing Company can be broken down into their component parts: number of subscriptions, subscription price, number of advertising pages, and advertising page price. To arrive at the income effect of each of these components, we consider the effect of each of these four variables separately by holding all other information constant. When this procedure is followed, XYZ's management learns that the effect of increasing the number of subscriptions was a positive influence on NIAT of $6.00 and that the effect of a lower average subscription price was to diminish NIAT by $3.00. Management also can see that the effect of increased advertising rates was a positive $1.20 and that the reduction in the number of advertising pages printed was a negative influence on NIAT of $1.20.

With the analysis performed so far, management has only examined one line of the income statement—total revenue. Management's next concern would be to analyze the cost of goods sold associated with that level of total revenue. The analysis



. . . whereas a drop in the unit price per magazine will almost invariably either stabilize or increase total circulation.

EXHIBIT 1

XYZ Publishing Company
Income Statement for the
Periods Ending 12/31/A and 12/31/B

		A		B
Circulation Revenue[1]		$ 50		$ 75
Advertising Revenue[2]		50		50
Total Revenue		$100		$125
Cost of Goods Sold:[3]				
Materials	30		36	
Direct Labor	20		24	
Factory Overhead	15		15	
Cost of Goods Sold		65		75
Gross Profit		35		50
Selling Expenses	10		15	
General Administrative	7		10	
Expenses		17		25
Operating Income		18		25
TAXES		6		10
Net Income After Taxes		$ 12		$ 15

Notes:
(1) Circulation Revenues: Period A—100 subscriptions @ $.50
Period B—200 subscriptions @ $.375
(2) Advertising Revenue: Period A—2,000 ad pages @ $.025
Period B—1,667 ad pages @ $.03
(3) Cost of Goods Sold: Assume no beginning or ending inventory of finished goods or work-in-process for either Period A or B.

EXHIBIT 2

XYZ Publishing Company
Statement of Sources of Change in Net Income
For the period ending 12/31/B

Sources		Effect on Net Income	
		Positive	Negative
1. Circulation Revenue (C.R.)			
(a) change in subscriptions (#) (+)			
B Subscriptions	200		
A Subscriptions	—100		
Increase in #	100		
× A Price	× .50		
Increase in C.R.	$50		
× A Operating Income Margin (O.I.M.)	× .18		
Change C.R. carried to Op. Inc.	9.0		
—Taxes at A rate	3.0		
Change in NIAT from C.R.	6.0	6.0	
(b) change in subscription price (S.P.)(—)			
B Price	$.375		
A Price	.500		
Change in Price (—)	$.125		
× B Subscriptions	× 200		
	25.0		
× A O.I.M.	× .18		
Change in Price carried to Op. Inc.	4.5		
— A Taxes	1.5		
Change in NIAT from S.P.	3.0		3.0

of cost of goods sold will provide the manager with greater information if this expense is broken down into its component parts: materials, direct labor, and factory overhead. The formula that we will employ to determine the net income effect of any expense is: multiply Period B revenue by the change in the expense margin; subtract taxes at Period A rates from the previous product and this amount is the net income effect of that expense. Following this procedure, we determine that materials, direct labor, and factory overhead all had positive effects on NIAT of: $1.00, $.67, and $2.50 respectively.

Effect of expense increase

If a breakdown of cost of goods sold was not available or the firm was a retail establishment, management could simply compute the net income effect of gross profit. This would be accomplished by multiplying Period B revenue by the change in the gross profit margin; subtract taxes at Period A rates from the previous product and this amount is equal to the net income effect. The two other expenses with which XYZ's management must concern itself are selling and general administrative expenses. Based on the previously outlined procedure, we can see that both these expenses had a negative effect on NIAT of $.83 and $1.67 respectively.

It would appear that we have completed our analysis of those factors which can affect net income, but there is still one more influence to consider. The tax rate itself plays a major role in the

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determination of the net income after taxes. Management may not have complete control over this expense but it may be able to alter the tax rate with a peripheral decision: change the depreciation method; recognize the loss in value of a fixed asset by selling it this year; liquidate its holdings of marketable securities which have declined in value. This listing is not intended to be a complete enumeration of the available ways to lower the effective tax rate. The intention was rather to expose several ways that the manager can affect an expense which seems to be outside of management's control.

The management of XYZ Publishing Company has summarized its analysis of the influences on net income in Exhibit 3 on page 34. With this report, management now has the answers to what it did right and where it went wrong. It is true that management may have subjectively known what the positive and negative influences were, but income flow analysis objectively identifies the influences, their magnitude, and their relative position among the other influences (percentage).

Effect on management decisions

As XYZ's management begins to prepare its budgets for Period C, decisions must be made about the broad operating policies which are within the control of management. An examination of XYZ's income flow analysis statement (Exhibit 3) indicates that management should expend some effort to increase the number of subscriptions since this variable was the largest positive influence on the change in net income. In its attempt to increase net income, management must also consider the fact that the largest negative influence on net income was the decrease in the average subscription price. Thus, it seems apparent that a subscription campaign conducted by XYZ Publishing Company must be handled carefully. Additional information should be collected to determine

Sources		Positive	Negative
2. **Advertising Revenue**			
(a) Change in Ad Pages (Ad Pg.)(—)			
B Ad Pages	1667		
A Ad Pages	2000		
Change Ad Pg.	333		
× B Ad Pg. Price	× .03		
Change carried to Op. Inc.	10.00		
× A O.I.M.	× .18		
Change carried to Op. Inc.	1.8		
— A Taxes	,6		
Change in NIAT from Ad Pg.	1.2		1.2
2. (b) change in Ad Price (Ad Pr.) (+)			
B Price	$.030		
A Price	.025		
Change in Ad Pr.	$.005		
× B A Pr.	× 2000		
Change Ad Pr. carried to Op. Inc.	10.00		
× A O.I.M.	× .18		
Ad Pr. change carried to Op. Inc.	1.8		
—Taxes at A Rates	— .6		
	1.2	1.2	
3. **Materials (M) (+)**			
B Revenue	125		
× Δ Materials Margin	× .012		
Δ in M to Op. Inc.	1.5		
—Taxes at A Rate	— .5		
NIAT from M	1.0	1.0	
4. **Direct Labor (D.L.) (+)**			
B Revenue	125		
× Δ D.L. Margin	× .008		
Δ in D.L. to Op. Inc.	1.00		
—Taxes at A Rate	— .33		
in NIAT from D.L.	.67	.67	
5. **Factory Overhead (F.O.H.) (+)**			
B Revenue	125		
× Δ F.O.H. margin	× .03		
Δ in F.O.H. to Op. Inc.	3.75		
TAXES at A Rate	1.25		
in NIAT from F.O.H.	2.50	2.50	
6. **Selling Expense (S.E.) (—)**			
B Revenue	125		
× Δ S.E. margin	× .02		
Δ in S.E. to Op. Inc.	2.50		
—TAXES at A Rate	— .83		
in NIAT from S.E.	1.67		1.67
7. **General Administrative Expenses (G.A.) (—)**			
B Revenue	125		
× Δ in G.A. Margin	× .01		
Δ in G.A. to Op. Inc.	1.25		
—Taxes at A Rate	— .42		
in NIAT from G.A.	.83		.83
8. **Change in Effective Tax Rate (T.R.) (—)**			
B operating income	25		
× Δ in T.R. (Op. Inc.)	× .067		
Δ in NIAT from T.R.	1.67		1.67
Total Changes in NIAT		11.37	8.37

Net change in NIAT (11.37 — 8.37 = $3.00) per statement
Net change in NIAT per income statement (15.00 — 12.00 = $3.00)

Advertising revenue policy decisions should be given full consideration in the preparation of Period C's budget since advertising revenue constitutes a major portion of total revenue. Too steep a rise in page price may defeat its own purposes since total number of advertisers may drop. But an anticipated increase in ad pages, if realized, can overcome this . . .

EXHIBIT 3

XYZ Publishing Company
Income Flow Analysis

Positive Influences	Income in Dollars	Per Cent
Number of Subscriptions	6.00	52.8
Advertising page price	1.20	10.5
Materials	1.00	8.8
Direct Labor	0.67	5.9
Factory Overhead	2.50	22.0
Total Positive Influences	$11.37	100.0

Negative Influences	Income in Dollars	Per Cent
Subscription Price	3.00	35.8
Advertising Pages	1.20	14.2
Selling Expenses	1.67	20.0
General Administrative Expenses	.83	10.0
Tax Rate Change	1.67	20.0
Total Negative Influences	$8.37	100.0
Net Income Effect	+$3.00	

the marginal revenue of each additional subscription and the elasticity of demand for XYZ's product.

Subscription prices still change

The effects of the aggressive subscription campaign do not stop changes in the average subscription price. Materials, direct labor, and factory overhead combined accounted for 36.7 per cent of the positive influences on net income. One possible explanation is that increased plant utilization, because of the increases in subscriptions, was responsible for these cost-of-goods-manufactured efficiencies. An alternative explanation is that these cost efficiencies were a result of the reduction in the number of advertising pages printed during Period B. In reality, the cause of the cost reductions was probably some combination of both alternatives. Management would look to the cost accounting system for a complete explanation of the reasons for the cost efficiencies. This information is absolutely necessary if a realistic budget for Period C is to be prepared.

Advertising revenue policy decisions should be given full consideration in the preparation of Period C's budget since advertising revenue constitutes a major portion of total revenue. During Period B, management raised the average advertising page price, which produced a $1.20 positive effect on net income. An apparent result of this price increase was the reduction in the number of advertising pages printed during Period B. This decline in the number of advertising pages reduced the net income by $1.20. Although a definite answer is not available, it would seem likely that the number of advertising pages during Period C would increase from its depressed level of Period B. This situation could be anticipated because of the 40 per cent reduction in the advertising cost per issue delivered from Period's A's $.00025 to Period B's $.00015. The advertising cost per issue delivered should decline further during Period C because of the previously suggested circulation campaign. If there was no boost in the advertising page price during Period C, advertising revenues should increase because of increased demand for XYZ's advertising pages.

Checks management decisions

The final negative influences on net income during Period B were selling and general administrative expenses. A valid cause-effect relationship is not apparent from the information provided, but the cost accounting system would be consulted to determine whether these expenses should be considered fixed or semivariable for Period C. At this point, it should be evident that income flow analysis is not a panacea for management—it does not provide all the answers. The major benefit of this statement is that it provides management with a relatively simple mechanism to analyze the effects of prior decisions on net income. Furthermore, it provides a wealth of information for effective profit planning. In most cases, management will find that the marginal benefit of using income flow analysis greatly exceeds its marginal cost.