SOME TENTATIVE RESULTS ON THE RELATIONSHIP BETWEEN SALES AND FINANCIAL STRUCTURE: A PRELIMINARY INVESTIGATION USING A SAMPLE OF GREEK COMPANIES

By

GEORGE VENIERIS
Associate Professor of Accounting
Athens School of Economics and Business Science

Sales are the purpose of existence of all business enterprises. In recent years the achievement of sales is being considered as the result of successful marketing. Sales growth, therefore, is thought of as depending on sales promotion alone. There are, however, other factors, refering to the financial structure of a company, that might be related to its sales growth. This is a subject that is not usually mentioned in text - books and has nor been examined much be researchers.

The purpose of this paper is to present some preliminary results of an investigation concerning the identification of two financial indices the product of which would give a number close enough to the percentage increase of sales between two points in time.

It is well known that Greek companies are not obliged by company law or by reporting practices to disclose their sales figures. The author of this article, however, succeded in obtaining sales figures of a small group of wine producing companies for the fiscal years 1980, 1981, 1982 and 1983. As the research deals with sales growth, companies that did not have their sales increasing on an annual basis over

the time period under examination were excluded from the sample. Only six companies fulfilled this research condition and their names appear in the appendix. The size of the sample, that is six companies, in conjunction with the time periods under examination, that is four fiscal years allowing the calculation of only three annual percentage increases in sales, did not permit the use of regression Techniques.

Financial indices measure specific financial characteristics of a company. The hypothesis tested is that if some of these characteristics can explain the percentage increase in sales between two fiscal years, then the following equation should be valid :

$$SG = Dm \times Dn \qquad (1)$$

where SG is the percentage increase in sales of a company and Dm and Dn are any two financial indices for that company that can explain it. No more than two factors can be included in the right hand side of equation (1). This is because the effort for the indentification of indices Dm and Dn is based on a trial-and-error procedure : in equation (1) all three factors, that is SG, Dm and Dn, are known. What is not known is which two indices to take under consideration each sime.

In order to give an answer to this question the following rationale was adopted: equation (1) can be rewritten as

$$\hat{Dm} = -B\frac{SG}{Dn} \qquad (2)$$

By taking the known value of any Dn index and dividing it into the known value of SG, a figure is found, let it be called B, which might or might not be similar to the known value of any other Dm index for the same company. If B is not found similar to the known value of any other Dm index the test has failed in the sense that the particular Dm, Dn couple cannot explain the percentage annual increase in sales. On the other hand, if B is found similar or equal to the known value of a certain Dm index the test has not failed because the spesicific Dm X Dn product equals or is very close to the SG Value. That is,

$$\text{if} \qquad B = \frac{SG}{Dn} \tag{3}$$

$$\text{and} \qquad B = Dm \tag{4}$$

$$\text{then} \qquad SG = Dm \times Dn \qquad (5) = (1)$$

The initial data for the calculation of the indices listed below were taken from the published financial statements, that is Balance Sheets and Profit and Loss Accounts, of the six ompanies cincluded in the sample for the years 1980, 1981, 1982, and 1983. The following financial indices were calculated :

D1 = Current Assets : Current Liabilities

D2 = Underpreciated Fixed Assets : Total Capital Employed

D3 = Total Debt : Total Capital Employed

D4 = Total Debt : Equity

D5 = Net Profit before Taxes : Equity

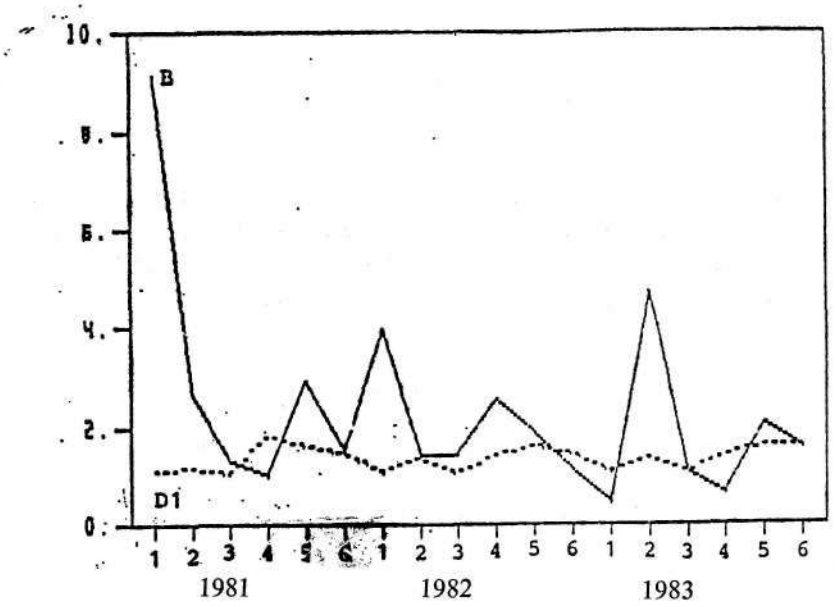
D6 = Net Profit before Interest and Taxes : Total Capital Employed

D7 = Net Profit before Taxes : Total Capital Employed

D8 = Earnings after Dividents : Earnings.

A computer programme was used in order to carry out the considerable amount of calculations necessary for the comparisons described by equations (3) and (4) above. The computer output was given in diagramatic form. The vertical axis of these diagrams measures the values of B and Dm used each time in the calculations while the horizontal axis presents cardinally the six companies of the sample in 1981, 1982 and 1983.

Diagram 1: Dn=D6 and Dm=D1



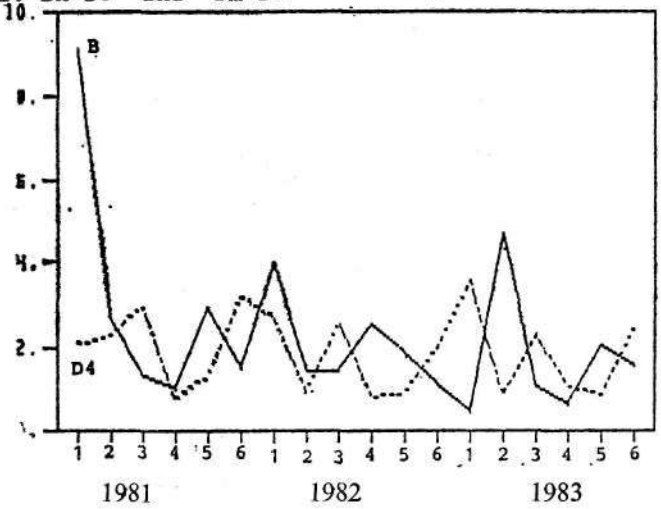
Company

Year	1	2	3	4	5	6
1981			+			*
1982		*	+	+	+	+
1983	+		*	+	+	+

It is obvious that the analysis used yielded a considerable amount of diagrams the total population of which cannot be possibly presented here. It is even questionable whether such a presentation would be worthwhile at all as quite a lot of these

idagrams did not show any interesting situation concerning the identification o indices Dm and Dn. What will be shown next, however, are the diagrams from which some tentative conclusions can be drawn, along with the findings from the

Diagram 2: Dn=D6 and Dm=D4

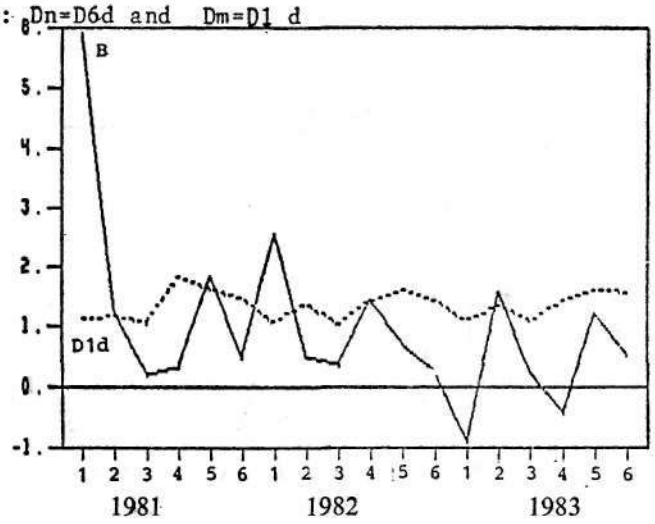


Company

Year	1	2	3	4	5	6
1981		+		+		
1982	+	+	+		+	+
1983				+	+	+

comparisons between B and Dm. The table after each diagram shows the results of the comparison for each company examined. An asterisk below the company number means that B was found equal to Dm while a cross means that the two values were very close.

Diagram 3: Dn=D6d and Dm=D1 d



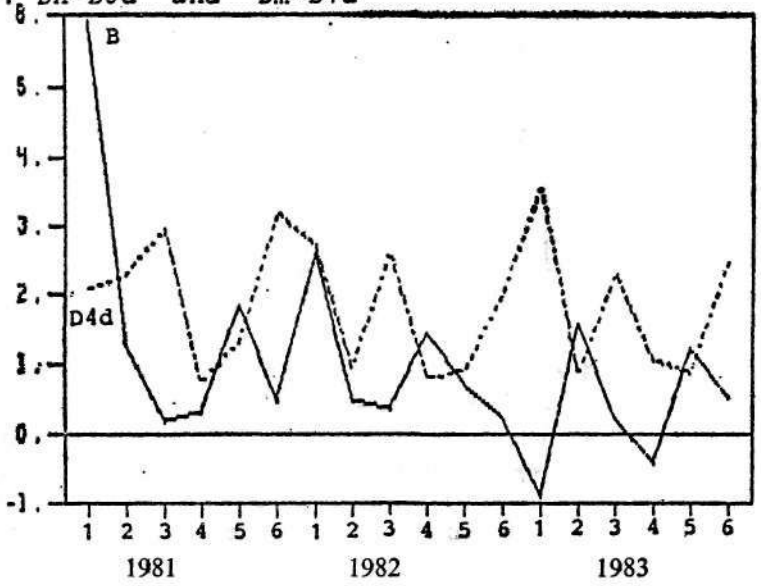
	Company					
Year	1	2	3	4	5	6
1981		*			+	
1982				*		
1983		+			+	

Of all the comparisons carried out, the ones shown in the diagrams were the more sensible. The conclusions that could be drawn from the diagramatic analysis are the following :

1) Indices D1, D4 and D6 seem the more suitable for explaining percentage annual sales growth for most of the companies examined. As it can be seen from diagrams 1 and 2, the values of B, calculated by using D6, and the values of D1 or D4 coincided or fell very close in most of the comparisons carried out In-

dex D1 in particular was found more times equal to the values of B than index D4. The use if indices D6 and D1 in equation (1) above would determine precisely the percentage annual increase in sales for company 6 in years 1981 and 1983, for

Diagram 4: Dn=D6d and Dm=D4d



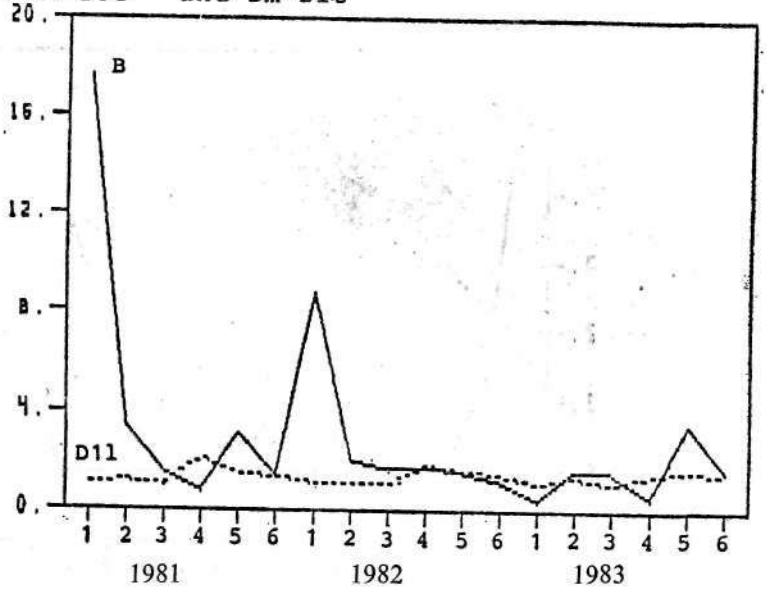
Company

Year	1	2	3	4	5	6
1981				+	+	
1982	*	+		+	+	+
1983		+			+	

company 2 in year 1982 and company 3 in year 1983. The evidence found supports the conclusion that profitability (as measured by index D6) and liquidity (as measured by index D1) or profitability (as measured by index D6) and gea-

ring (as measured by index D4) could be used in determining percentage annual sales growth.

Diagram 5: Dn=D6ℓ and Dm=D1ℓ



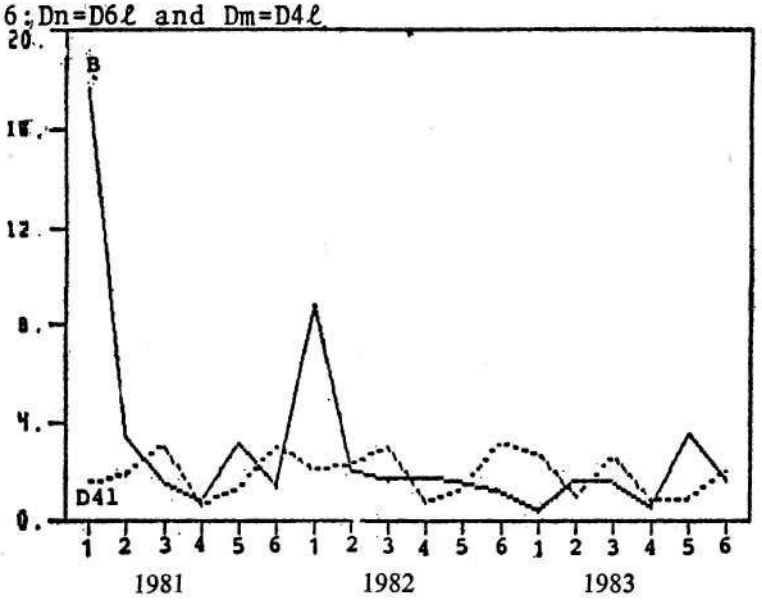
Compay

Year	1	2	3	4	5	6
1981			+	+	+	*
1982		+	+	*	*	+
1983	+	+	+	+	+	*

2) The use of deflated data for the calculation of indices D1, D4 and D6 did not improve the ability of equation 1 in determining the percentage annual sales growth. This can be seen from diagrams 3 and 4. Data were price adjusted by using the price index for the wine industry in years 1980, 1981, 1982 and 1983.

3) The ability of equation (1) in determing the percentage annual sales growth was considerably improved when a one - year time lag was introduced. This can be seen from diagrams 5 and 6, particularly when compared to diagrams 1 and

Diagram 6; Dn=D6ℓ and Dm=D4ℓ



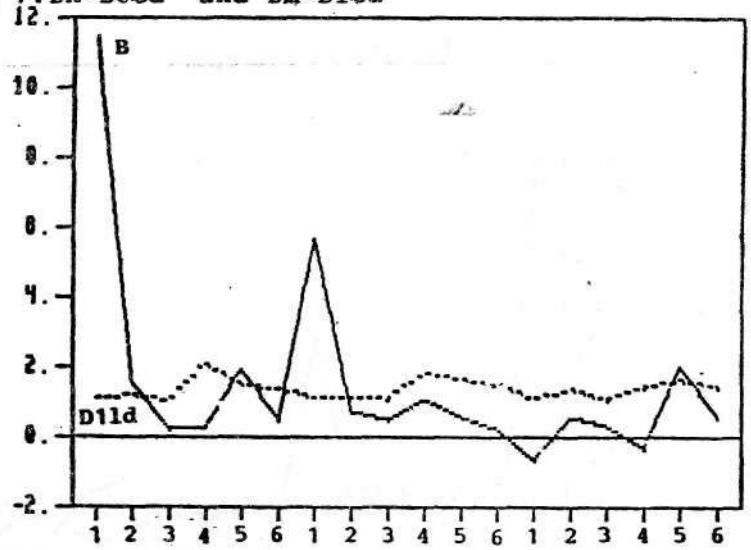
Company

Year	1	2	3	4	5	6
1981		+	+	*	+	+
1982		*	+	+	*	+
1983	+	+	+	*	+	*

2. One possible explanation that could be given to this finding is that this year's gearing via credit sales, inventory formation and credit purchases, and this year's profitability, via retained earnings, will affect next year's sales.

The use of deflated data in lagged equation (1) did not improve its usefulness, as it can be seen from diagrams 7 and 8.

Diagram 7: Dn=D6ℓd and Dm=D1ℓd



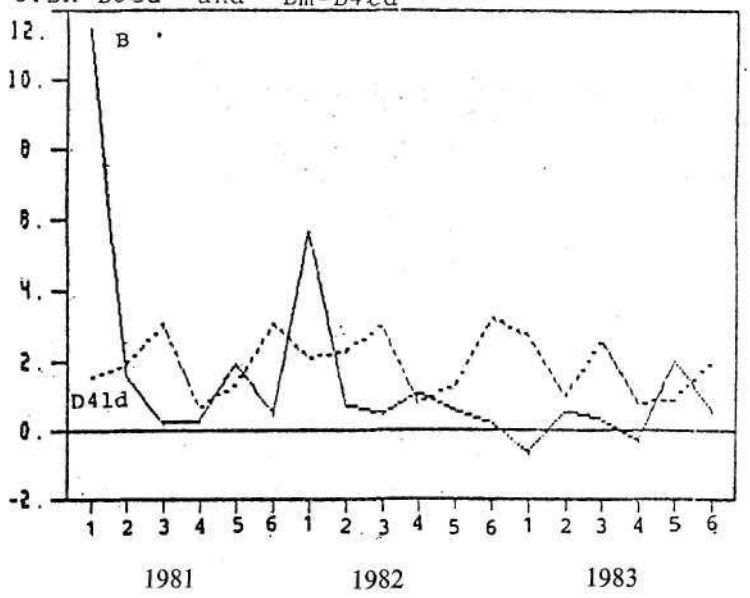
Company

Year	1	2	3	4	5	6
1981		+	+		+	+
1982		+	+	+	+	+
1983		+	+		+	+

These conclusions should be characterised as tentative because they are based on a very limited sample of companies and also on a few yearly observations that were available. More research is necessary in order to better establish the relationship between sales growth and the financial structure of a company. However,

it should be stated that the product form used in equation (1) gave much better results in approaching a determination of percentage annual sales growth than the comparison of SG with the percentage annual change of the values of single indices or other items of the published financial statements of the companies under examination. More explicitly, before the analyais described above was carried

Diagram 8: Dn=D6ℓd and Dm=D4ℓd



Company

Year	1	2	3	4	5	6
1981		*		+	*	
1982				*	+	
1983		+		+	+	

out, the percentage annual change of the following items were calculated: percentage change in stockholders' equity, percentage change in working capital, percentage change in debt capital, percentage change in earnings before interest and taxes, percentage change in total capital employed, percentage change in liquidity as measured by index D1, percentage change in gearing as

measured by index D3 and percentage change in profitability as measured by index D6. Each one of these annual percentage changes were plotted in a scatter diagram against the annual percentage changes in sales. None of these comparisons gave results as good as those presented in diagrams 1, 2, 5 and 6 above.

In works of other researchers on the same subject, like C. W. Kyd [1] and R. C. Higgins [2], it has been suggested that sales growth can be determined by equation (1) when earnings retention ratio (index D8) and return on equity (index D5) are taken under consideration. The present analysis for the Greek wine companies showed that profitability and liquidity or gearing are more suitable for determining percentage annual sales growth.

Diagrams 1, 2, 5 and 6 show that equation (1) is more successful for some companies than for others. For examble the equation has been more succes sful with companies 3 and 6 than with companies 1 and 2. This might mean that each company might have its own equation for explaining its sales growth and that it does not exist one single equation to be used by all companies. It is important, however, for each company to know the factors affecting its sales growth because the tacid implication of the analysis in this paper is that sales should increase in such a rate that should not put in danger its financial structure- If sales, for example, grow faster than the product of indices Dm and Dn then the company might be forced to increase its gearing or increase its common stock. On the other hand if sales grow slower than the product of indices Dm and Dn the company might strengthen its capital structure by improving its debt ratio and increasing its investments.

1. C. W. Kyd : «Managing the Financial Demands for Growth», Management Accounting, December 1981.

2. R. C. Higgins : «How Much Growth Can a Firm Afford ?», Financial Management, Fall 1977.

A P P E N D I X

The **wine companies whose sales were examined in this paper were the fol-owing** :

1. **V. G.** Spiliopoulos **S.A.**
2. A. Kambas **SA.**
3. **D.** Kourtakis SA.
4. Achaia - Claus SA.
5. E. Tsantalis SA.

61 J. Boutaris and Son S. A.