

Determinants of Financial Structure in the Central American Common Market

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Introduction

■ Empirical tests on determinants of corporate debt ratios have not been conclusive. In the case of U.S. manufacturing, the studies of Scott [9], Schwartz and Aronson [8] and Scott and Martin [10] support the hypothesis that debt ratios vary by industry class. On the other hand, Remmers, Stonehill, Wright, and Beekhuisen [6] conclude that industry does not appear to be a determinant of corporate debt ratios in the manufacturing sectors of the Netherlands, Norway, and the United States, whereas it does appear to be a determinant in France and Japan. Toy and others [15] use growth, profitability, and risk in an attempt to explain differences in financial structures. The explanatory power of their model varies greatly across countries with a considerable part of the variance unexplained. These problems cloud the usefulness of

their model. The Stonehill and Stitzel [13] study indicates significantly different financial structure norms across countries, even among companies in the same industry.

With the exception of the last study, all the other works are limited to specific countries; no results are reported across countries. One reason for this tendency seems to be the lack of comparable data, which results partly from differences in accounting practices. Moreover, no studies are reported for less developed countries (LDCs) or for a group of nations with common market types of arrangements. Given the theoretical problems of determining optimal global financial structure [1], ever increasing internationalization of corporate activity, and the need to conform to the local financial norms [13], studies

focusing on nations other than the major developed countries are suggested. Further, if financial norms and practices within closely-linked groups of nations are found to be similar, it would substantially simplify multinational financial planning.

Hence, the present work studies the financial structures of firms domiciled in the Central American Common Market (CACM) countries using a consistent data base obtained from primary sources.

The Central American Common Market

The CACM was established in 1960 with Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua as its members. It is described in publications of the CACM, Business International Corporation, and Price Waterhouse and Company. During 1960s, the CACM was hailed as a model of integration for other small developing economies, but, since 1969, complex political and economic problems have seriously threatened further integration of the community. Progress toward restructuring of the treaty has been very slow. At the end of 1974, Sieca, the market's permanent secretariat, issued a preliminary draft called the Treaty that Creates the Central American Economic and Social Community. If adopted, the treaty would reorganize CACM institutions, provide more operating flexibility, institute tax reforms, harmonize fiscal, financial, and foreign investment policies in the area, create a monetary union, adopt the Brussels tariff nomenclature, and adjust tariff levels to support industries appropriate to the region while at the same time not overly penalizing imported products that are not economically viable for CACM production. Although it is generally expected that the tariff proposals will be adopted soon, the sections on tax and social reforms have encountered heavy resistance. Despite this, all CACM-produced goods move freely within the area (except between El Salvador and Honduras), and tariffs on regional imports have been equalized for most products.

The typical financial system of a CACM country consists of the Central Bank, government development bank, savings and loan institutions, insurance companies, finance companies, and commercial banks. The primary sources of short-term credit are the commercial banks. The regional development bank CABEL, national development banks, and private *financieras* are the most important medium- and long-term sources of financing. The stock and bond markets are in their infancy, as indicated in an

earlier discussion of capital markets in developing countries [3]. Most issues are privately placed through personal and business group connections, development banks, and *financieras*, or at times the commercial banks. Trading in issued securities is generally thin, irregular, and at times non-existent.

A large part of the private sector business activity emanates from a special type of institution called "The Business Group" which is also common to many other developing countries of Latin America, Asia, and Africa. The group, as described by Strachan [14] and Leff [5], consists of people linked by family ties, tribal or religious commonality, or personal connections. The group has a broad capital base and is generally well-diversified in its business activities. Most major groups in the CACM span member countries; they run their own banks that finance the group's investments. They account for a large share of total corporate profits and have direct access to other private savings of the economy. Thus, the groups seem to perform the principal functions of a capital market by providing a mechanism for channeling savings to investors and by allocating these resources among competing activities according to their relative rates of return.

Methodology

To study the determinants of financial structure in the CACM, I have chosen approximately 15 large domestic private sector companies for each of the four Central American countries (Costa Rica, Guatemala, Honduras, and Nicaragua). El Salvador was omitted because of inadequate information.

Industrial corporations were first listed by size (total assets) at the beginning of the study period (1968-1974). Central Bank publications were a primary source. Foreign-owned, foreign subsidiaries, or foreign-controlled corporations were eliminated. After the initial selection, various balance sheet and income statement items were obtained by interviews with owners or managers of the companies. Data were examined to understand the company's reporting practices and to spot obvious misrepresentations. Cross-checks were also made with Central Bank and tax authority figures.

This procedure was preferred over random sampling, because, in general, large corporations had reliable and consistent data that they were willing to provide under strict secrecy agreements. A few companies were eliminated from the sample because of a lack of reliable information, or inconsistency or in-

completeness. Differences in reporting practices were found even among companies in the same country. Serious effort was made to reconcile such differences across companies and countries. The study could not be conducted in El Salvador due to the lack of information.

The common market arrangements have contributed to the development of industries across countries on the basis of comparative advantage. Given this development and the small size of the market, narrow, four-digit SIC code type of classifications do not represent industry coverage of firms in the CACM. Hence, certain closely-related industries were combined. To some degree, this makes cross-country testing more robust by increasing the sample size of a given class of industry. A list of the industry classifications is provided in the appendix. Secrecy agreements do not allow us to reveal corporate identities.

Two-way analysis of variance (ANOVA) with fixed industry and country effects on total debt ratios was used to test the hypothesis that industry and country norms influence financial structure. Firms domiciled in Costa Rica, Honduras, and Guatemala were used. The Nicaraguan firms unfortunately could not be included in the two-way ANOVA because of secrecy agreements. Since the time factor was found to be statistically not significant, total debt ratios for different years were used as replicate observations to increase sample size.

The debt ratio was defined as the ratio of total debt to total assets at book value. Total debt included both short-term and long-term components. Debt ratios were adjusted to reflect the "true" value of the owners' liabilities. Thus, fixed obligations of the firm to its owners reported as debt were incorporated in the net worth for the computation of total debt ratios. These ratios were calculated for a time span of four to seven years, depending on the availability of data.

Two-way analysis of variance is an extension of the one-way ANOVA to the case where the investigator is interested in studying the effects of two independent variables (country and industry factors in this case) on a single criterion (total debt ratio in this case). This procedure is generally more efficient compared to the one-way ANOVA, since part of the unexplained variation is now attributed to another factor. It has essentially the same underlying mathematical assumptions of normality and homogeneity of variances. A significant interaction would suggest that the effect of a given factor is not independent of the other factor in the analysis, and the interpretation of the two effects must be qualified [7, pp. 323-50]. Generally, a

separate one-way ANOVA for each factor across industries in a given country and across countries for a given industry is warranted. The assumption of homogeneity of variances is much more important for this procedure; this has not been examined by most of the past researchers [10, p. 68]. We tested for the appropriateness of this assumption which we found did not hold.

Hence, we followed two different approaches. First, the variables (debt ratios) were transformed in such a manner that the homogeneity of variance assumption could not be rejected in all cases. Hartley's test at the 5% level of significance was used. The arcsine transformation is especially appropriate to proportions and was used throughout this study [11, pp. 380-87]. Second, distribution-free tests, which do not depend on any assumptions regarding the population parameters, were performed to improve the generality of the results derived from the above parametric procedures. The well known Kruskal-Wallis one-way analysis of variance by ranks was used. The computed test statistic was compared against appropriate chi-square values at the 5% level of significance [2, pp. 321-24].

Finally, when the overall hypothesis of equal means is rejected by ANOVA, one can reasonably assume that the largest mean is significantly larger than the smallest mean if all the samples are of the same size. Since the contribution of any sample to a significance test depends on sample size, and if either the largest or the smallest mean comes from a sample with a smaller number of observations than one of the other samples, the rejection of the overall hypothesis of equal means without identifying which means are significantly different is not very satisfactory. Hence, Tukey's honestly significant difference test was used to make pairwise comparisons among mean total debt ratios. The procedure was modified for unequal sample sizes [4, 7].

The Results

Results of the two-way ANOVA indicate significant interaction between the industry and the country factor. Further, the country norms and inter-industry differences are significant, as suggested by the computed F statistics.

In view of the highly significant interaction among the two independent factors, a separate one-way ANOVA for each factor was performed. The significance of the industry factor was tested by way of one-way ANOVA on total debt ratios for all CACM

Exhibit 1*. Two-Way Analysis of Variance Across Industry and Country

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F
Industry	4041	7	577	13.8	0.000
Country	601	2	300	7.2	0.001
Industry x Country	2829	10	283	6.8	0.000
Residual	6891	165	41.8		
Total	14298	184	77.7		

*The analysis uses arcsine transformed data.

Exhibit 2*. Total Debt/Total Assets by Industry — One-Way Analysis of Variance

	No. of Observations	No. of Industries	F Ratio	F Prob.	Kruskal-Wallis Test	
					H-Statistic	X ² 0.995
Guatemala	50	7	6.8	0.001	26.7	18.5
Honduras	70	8	5.5	0.001	23.2	20.3
Costa Rica	65	5	29.9	0.000	38.8	14.9
Nicaragua	77	11	45.7	0.000	65.1	25.2

*The analysis uses arcsine transformed data.

countries individually, including Nicaragua. Since the assumption of homogeneity of variance did not hold, the arcsine transformation was used. For the same reason, non-parametric analysis of variance test (Kruskal-Wallis) was performed as discussed. Exhibit 2 strongly confirms the initial results from the two-way ANOVA. Finally, Tukey's honestly significant difference test was used to make pairwise comparisons among mean total debt ratios. Exhibit 3 indicates that the industry means are indeed different for all countries in the sample.

The significance of the country factor was tested using the one-way ANOVA for firms in the same industry but domiciled in different CACM countries. As reported in Exhibit 4, the country factor was significant in three out of a total of eight industry classifications. Thus, in general, country norms are not as important as industry norms in the CACM. Finally, the overall financial norms across CACM over the time period studied are very similar. Average total debt ratios and their standard deviations for our sample are, respectively, 0.44 and 0.03 for Costa Rica, 0.49 and 0.02 for Guatemala, 0.46 and 0.03 for Honduras, and 0.45 and 0.03 for Nicaragua.

Determinants of Debt Ratios in the CACM

A priori, one would expect that the existence of

common market arrangements, location of industries on the basis of comparative advantage resulting from CACM-wide harmonization of investment incentives, freedom of capital movement, and close business relationships across countries (same owners in a given industry and at times across industries) would result in similar capital structure norms across the CACM. Country norms may not be as important as industry effects, and substantial interaction between country and industry factors should be obtained. Our results confirm these expectations, further indicating that the industry norms are highly significant.

The most important determinant of financial leverage, however, as discovered by detailed discussions with the owners and managers of the sample firms, is the ability of the firms to obtain debt and equity financing as opposed to their desire to attain a preferred capital structure. Since debt financing is obtained largely from financial institutions that are linked to a business group, a firm's total debt depends on its relationship with such groups. Credit is generally based on the individual owner's capacity to repay rather than on the financial health of the firm. The other important long-term source, CABEI, the regional development bank, requires collateral, mortgages on fixed assets, or bank guarantees for its loans. Guarantees are very important, and loans without recourse to owners are normally not extended.

Exhibit 3*. Tukey HSD Multiple Range Test for Industry Means at 5% Level

Guatemala	No. of Industry	2	1	3	6	5	9	10				
	Industry Mean	40.7	41.8	42.4	46.0	49.0	52.7	55.0				
Honduras	No. of Industry	10	2	3	6	4	5	1	9			
	Industry Mean	30.5	37.9	40.3	41.2	43.5	44.6	45.0	54.2			
Costa Rica	No. of Industry	3	2	1	4	5						
	Industry Mean	28.8	41.6	42.0	45.8	53.5						
Nicaragua	No. of Industry	23	32	31	27	26	33	29	30	35	22	28
	Industry Mean	19.0	29.2	36.6	36.7	38.4	42.4	42.7	50.6	51.3	53.3	68.4

Any two means not underscored by the same dotted line are significantly different, and any two means underscored by the same dotted line are not significantly different.

*The analysis uses arcsine transformed data.

To a lesser degree, credit ratings and other proxies for financial risk are important in determining leverage use. Equity financing also depends on close ties with groups of investors, friends, and acquaintances. Due to the absence of organized securities markets, a large part of the equity is financed through retentions. Thus, the availability of debt and equity financing are considered to be very important determinants of debt ratios by the CACM decision-makers, which is very similar to the response obtained by Stonehill *et al.* [12].

Among companies, differences in debt ratios can be attributed to their age, profit growth rates, and owners' attitudes toward risk and control. Across industries, the debt ratios may differ due to the nature of the industry and past and future expectations of growth and profitability, as well as the presence or absence of substantial group interests in a particular industry.

Summary and Implications

This study supports the hypothesis that there are statistically significant differences in the financial structures of different industries in the CACM countries. Such variations have persisted over a reasonable time span. The effect of the country factor is not as strong as the industry classification. Financial integra-

tion within the common market has led to similar industry and overall financial norms across CACM countries.

The multinational manager may be unaware of some new determinants of financial leverage that are generally not considered in most U.S. literature. Outside the U.S., especially in developing countries, the concepts of the "group," availability of capital, personal guarantees for corporate borrowings, and the role of development banks are very important determinants of debt ratios. The assumptions of perfect and complete capital markets that underlie the modern theory of capital markets frequently do not hold in countries outside the U.S.; hence these theories may not be applicable without substantial adaptations for multinational management. As Adler [1] points out, optimal global financial planning may be impossible. This, together with the desire to conform to local financial norms, strongly suggests the need to improve our understanding of local norms and practices. Lastly, it is possible that the financial norms in other countries with common market types of arrangements (the EEC, or ANDEAN Group, for example) may also be regional in scope. If future research substantiates this hypothesis, then it may suggest that multinational corporations may benefit from financial planning at the regional level rather than at the country level.

Exhibit 4*. Total Debt/Total Assets by Country — One-Way Analysis of Variance

Industry	F Ratio	F Prob.
1	0.946	0.399
2	0.448	0.635
3	17.761	0.000
4	0.241	0.629
5	8.545	0.002
6	1.580	0.235
9	0.688	0.422
10	29.200	0.001

*The analysis uses arcsine transformed data.

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Appendix.

A. Industry Classifications

Industry Number	Industry Classification
1	Construction and Materials
2	Beverages — Alcoholic and Non Alcoholic
3	Food
4	Chemicals and Plastics
5	Textiles and Apparel
6	Consumer Products
9	Meat Packing
10	Sugar Mills

Above classifications are for Costa Rica, Guatemala, and Honduras. Similar classifications for Nicaragua can not be reported due to the secrecy agreement.

B. Time Periods of the Study

Country	Time Period Studied
Costa Rica	1968-1974
Guatemala	1969-1973
Honduras	1968-1972
Nicaragua	1968-1974