BANKING STRATEGIES AND PERFORMANCE: THE CASE OF BANKS IN CARICOM

by

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Anthony Birchwood[2]

1.0 Introduction

Competition forces banks to continuously search for strategies to improve their competitiveness. Such strategies are influenced by the interaction of socio-economic factors; regulations; institutional factors and advances in technology. In the present global environment, there appears to be a race by banks, particularly in the advanced industrialised countries, towards the attainment of critical mass. The urgency stems from the perception that mass is essential for banks to be leaders in the financial industry. Moreover, it is believed that expansion in assets affords banks the opportunity to position their brand name in the minds of consumers, thus facilitating the use of cost effective alternative distributive systems that requires less face to face interaction.

One way by which banks have attempted to hasten their ascendency to attaining critical mass, is through mergers. The spate of mergers, which has occurred in mature markets in recent years, raises several questions concerning how the performance of banks is related to their scale of operations. Are there contrasting features, for example, between small and large banks? In particular, is scale of operations important to profitability and efficiency, in the context of micro states? Are the critical strategies of banks

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[1] This study is part of a larger study on commercial banking. I would like to thank Roland Craigwell, Shelton Nicholls and other participants in the CCMS Review Seminar held in December 1999, for their comments on a previous draft of the paper. All errors, of course, remain mines.

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dependent on their scale of operations? The pertinence of these questions arises from the fact that the CARICOM area consists of micro-states and financial services in these states tend to be fragmented, being isolated from each other in geographic terms.

The objectives of this study are two-fold. First it explores the issue concerning whether scale matters to the performance of banks. Second, it seeks to investigate which aspects of strategies employed by banks in CARICOM are significant to their performances. The first objective is investigated primarily by comparing means of performance attributes and through the exposition of graphs and scatter plots. These performance objectives are assumed to be profitability and operating efficiency.[3] Profitability was measured in terms of return on equity and net interest margin, while operating efficiency was measured in terms of the non-interest expense incurred by banks.

An econometric study, using panel data was then used to investigate the relationship between bank strategies and performance. Bank strategy is used here to refer to the game plan on the part of banks, geared towards the realisation of given performance objectives. These strategies are assumed to be exercised through a variety of measures. These measures include those aimed at expanding market share, attaining operating efficiency, achieving credit expansion, and maintaining a healthy equity asset mix. In addition, the logistical factors such as the scale of branch network and inflationary expectations are assumed to affect their performance. The estimation of the significance of bank strategy to their profitability was done, using a fixed effect model.

The entire study was conditioned on a sample of banks drawn between 1990 and 1996 from the CARICOM area. The study begins with an outline of the various hypotheses formulated for the econometric model. The methodological procedure for the econometric model is highlighted in Section 3. Details concerning the underlying data are mentioned in Section 4 after which, the findings concerning the performance and scale of banking operations are undertaken in Section 5. For this section, means of the performance attributes of banks are compared according to scale of operations, the relationship between asset growth and performance is explored. The results emanating from the econometric study are then reported in Section 6 after which the study is concluded in Section 7.

2.0 Competitive Factors and Time Effects

Two related hypotheses were tested for: the Market Structure hypothesis and the Efficiency hypothesis. These hypotheses stem from two opposing views, concerning the likely behaviour of banks when they dominate the market, especially through mergers. One view, the market structure hypothesis, is that increased merger activity among banks can result in greater market power and as a consequence, banks with greater market power would widen their interest rate spreads while providing fewer services. The other view, the efficiency hypothesis, is that merger activity can increase bank efficiency, which could in turn, be transmitted to consumers through lower interest rate spreads.

[3] Even though banks may always seek to improve upon these attributes, in reality there are short-run tradeoffs. For example, such tradeoffs may occur between profitability and bank soundness, or between cost minimisation in the short-run and long-term profitability. Thus banks may not be able to pursue maximisation of profitability or efficiency in the short.

Dynamic relationships between the strategies and performance of banks were hypothesized in order to explore the implications of various attributes of their strategies over time. To conduct the investigation, the following models were hypothesized:

$$ROE_{it} = f^1(MSA_{it-1}, BP_{it-1}, OCAS_{it-1}),$$
$$NIM_{it} = f^2(MSA_{it-1}, OCAS_{it-1}, LAS_{it-1}, INF_{it-1}),$$
$$OCAS_{it} = f^3(MSA_{it-1}, BP_{it-1}, LAS_{it-1}),$$

where MSA_{it} denotes market share in terms of the ratio of assets of bank i to industry assets at time t; BP denotes the ratio of bank branches to population; OCAS denotes the ratio of operating costs to assets; LAS denotes the ratio of loans to asset; INF denotes inflation measured in terms of the percentage growth in consumer prices; ROE denotes return on equity derived as the ratio of net income to share holder's equity and NIM denotes net interest margin, which is derived as (interest received less interest expense)/bank assets.[4]

A variant of the market structure hypothesis, the relative market power (RMP) hypothesis, was used to test the significance of market structure to profitability. The RMP hypothesis posits that banks with large market share can use their market power to exploit the market and increase profitability by widening interest rate spreads.[5] Non-rejection of the hypothesis would be dependent on whether market share is positive and significant to both profitability and net-interest margin. The latter is used as a dependent variable in the f^2 relationships, to act as a proxy for net earning assets of the bank. Another hypothesis, the efficiency hypothesis, was tested for by including the operating cost to asset ratio as a proxy for operating unit cost in both f^1 and f^2. This hypothesis would not be rejected if operating unit costs is negatively and significantly related to profitability, and market share is significantly and negatively related to operating unit cost.

The scale of bank branches was included in the f^1 and f^3 relationships, to see whether the existing network observed in the last year, is significant to the future performance of banks. Branches may be facilitative to gaining higher profitability levels if they increase the prospects for banks to win new customers and cultivate their loyalty. However, owing to the availability of alternative distribution methods, branches have being criticised as been an unnecessarily expensive way of distributing services.

The volume of loans in the asset portfolio of banks was included in the f^2 relationships as a proxy for their exposure to credit risk. A positive and significant relationship between this variable and NIM can be thought of as suggesting that banks increase their interest rate spread when the volume of their loans increase, as they require a higher risk premium to mitigate their exposure to default risk. A negative and significant relationship in contrast, would suggest that banks are constrained by demand considerations, from widening interest rate spreads, in order to gain compensation for exposure to default risk. Inflation is also included as a regressor in the f^2 relationship, as the magnitude of the net interest margin is expected to be influenced by the expectations of banks concerning the growth in prices. It is possible that banks would widen their interest rate spreads if they expect higher inflation. Inflationary expectations were

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[4] The variables for the various equations were already defined in chapter 4. The definitions are repeated here for ease of reference.

[5] Banks can exploit their market power for example, by widening their interest rate spreads, increase fees and offer tied contracts.

therefore controlled for in the f^4 model, by assuming that banks would observe the inflation level in the last period and form their expectations of inflation for the next period.

The volume of loans in the asset portfolio, is used as a proxy for the frequency of loans in the f^5 relationships. Its use as a proxy in this respect is not without its flaws, since the volume of loans outstanding is also a function of the magnitude of funds borrowed. However, in the absence of data on the frequency of lending, the loans to assets ratio is used as a crude proxy to signify frequency of loan transactions

2.1 Competitive Factors and the Scale of Bank Operations

Hypotheses were examined contemporaneously across different bank sizes. Banks were categorized into large, medium and small according to asset size. The following hypotheses were formulated and tested for each size category:

$$ROE_{it} = f^4(MSA_{it}, BP_{it}, OCAS_{it})$$
$$ROE_{it} = f^5(LAS_{it}, EQ_{it}, INF_{it})$$
$$NIM_{it} = f^6(MSA_{it}, OCAS_{it}, LAS_{it}, INF_{it})$$
$$OCAS_{it} = f^7(MSA_{it}, LAS_{it}, EQ_{it})$$

where EQ denotes the equity multiplier, derived as the ratio of shareholder's equity to assets.

The RMP and the efficiency hypothesis were tested for in the same way as described in the previous section. An additional set of functional relationships were formulated as f^5, in which profitability depends on how banks manipulate variables on their balance sheets and also on their expectations concerning inflation. Inflationary expectations were assumed to influence the supply of value added services by the bank, with consequent implications for profitability. For example, banks may cut back on lending, if they are uncertain about the speed with which prices might increase in the future. On the other hand, they may increase their lending if they anticipate a stable environment.

The equity multiplier (EQ) is introduced into the set of relationships, as a proxy for capital strength. The primary interest here, is to see if there is a tradeoff between profitability and capitalisation. The equity multiplier is also included in f^7, this time, to see whether the magnitude of shareholder's equity is an influential factor on the maintenance of operating efficiency by banks.[6]

3.0 Econometric Procedure

The covariance model is used to estimate fixed effects via pooled least squares. Calculation of the fixed effects controls for variation in the data with respect to the explanatory variables between banks and other explanatory variables that vary within banks. It is assumed that exogenous variables are non-stochastic and that they are not correlated with the error term. Furthermore, the source of random variation is assumed to lie in the error terms, which are normally and independently distributed with zero mean. In the covariance model, the intercepts are allowed to vary across banks while the slope parameters are constant across time and banks. Thus, the coefficients of the parameters are reported, after controlling for individual bank effects.

There is also the possibility that shareholders with larger stake in the business would be more vigilant in supervising the bank's management, since their returns can potentially increase as costs are minimised. Moreover, lower operating cost may allow banks to better position themselves to withstand competition in the sector.

A panel of a sample of data drawn on N individuals over T periods can be expressed as

$$y_{it} = \alpha + \beta_2 x_{2it} + \ldots + \beta_K x_{kit} + \mu_{it}; \quad i = 1,\ldots,N;\ t = 1,\ldots,T$$

$$= \alpha + \tilde{x}_{it}\tilde{\beta} + \mu_{it},$$

The covariance model of individual effects can be expressed as:

$$y_i = D_N\alpha_i + \tilde{X}_i\tilde{\beta} + \mu$$

where

y_i denote a NT × 1 vector of y_{it}, D_N denote a NT × N matrix of individual dummies, ι_T, with a kronecker product representation:

$$D_N = I_N \otimes \iota_T,$$

$\tilde{X}_i$ denote a NT × (K-1) matrix of $\tilde{x}_{it}$ vectors and μ_i is a NT ×1 vector of errors.

The ordinary least squares (OLS) estimator is BLUE, if the explanatory variables are non-stochastic and independent of the errors and the random error terms are independent, homoscedastic and the mean is equal to zero.

The estimator can be expressed as

$$\hat{\tilde{\beta}} = (\tilde{X}'W_n\tilde{X})^{-1}\tilde{X}'W_n y$$

$$V(\hat{\tilde{\beta}}) = \sigma^2(\tilde{X}'W_n\tilde{X})^{-1}$$

where $W_n = I_{NT} - \frac{1}{T}(I_N \otimes J_T)$, is an idempotent matrix of order NT and rank NT-N.

The model can be transformed to obtain the OLS estimators by calculating deviations from the means of the variables with respect to individual banks. Once the model is transformed, the intercepts can be obtain through the following estimator:

$$\hat{\alpha}_i = \hat{y}_i - \sum_{k=2}^{N} \hat{\tilde{\beta}}_k \tilde{x}_{ki}$$

A F test can be formulated to test the null hypothesis that the intercepts are equal and there are no individual effects.

4.0 Data

To initiate the study, financial data from a sample of commercial banks operating within CARICOM were collated, given the absence of published comprehensive data on the attributes of individual commercial banks operating to the region.[7] The data were compiled from a sample of annual reports published by these institutions for the period 1990-1996. Aggregate industry financial data for the sub-markets were obtained from the respective central bank publications for the same period. The coverage of markets in terms of asset size are reported in Table 1.[8]

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7 Unfortunately, data are obtained by the monetary authorities on the basis of confidentiality, and as such it they are not accessable.

8 The percentages are only a guide, as the financial year covered by the commercial bank reports, varied from bank to bank, hardly coinciding with the calendar year, while the central banks industry figures coincided with the calendar year.

TABLE 1: REPRESENTATIVE SAMPLE
PERCENTAGE OF ASSETS IN SAMPLE TO INDUSTRY ASSETS

	1990	1991	1992	1993	1994	1995	1996
Industry	41.35	40.95	42.59	43.97	47.55	48.13	46.71
Antigua	36.91	32.91	39.95	39.95	46.68	42.28	42.31
Bahamas	13.01	12.99	13.57	13.80	16.51	17.54	17.34
Barbados	26.75	26.62	28.29	27.54	23.47	20.49	16.79
Belize	40.96	47.11	49.06	50.94	52.05	49.50	41.85
Dominica	32.48	32.38	32.36	34.69		36.76	37.57
Grenada	64.68	64.17	50.36	56.40	59.52	59.70	58.84
Guyana	48.86	16.88	50.75	94.24	89.35	92.17	55.62
Jamaica	47.20	43.46	42.31	40.79	42.75	41.32	35.48
Montserrat	17.59	22.42	25.43	25.51	28.56	30.31	
St. Kitts	50.12	52.47	44.72	43.51	5.86	6.25	7.27
St.Lucia	22.47	21.00	24.35	33.43	33.65	34.95	23.22
St. Vincent	40.70	43.86				40.88	40.33
T&T	58.60	66.33	66.33	70.43	85.12	91.75.	100

Source: Individual Commercial Bank assets were extracted from respective commercial banks Annual Reports. Industry Data were extracted from the publications of the respective central banks.

Based on the ratios, more than 40 percent of the entire industry in the region appeared to be covered by the sample in each year. The coverage of various sub-markets differed, however, with the low coverage in some sub-markets being partly due to the large extent of foreign subsidiaries in these markets, as only banks that were totally locally owned or that exhibited some percentage of local ownership, were included in the sample. Furthermore, the financial attributes of the holding companies under which some banks operated were excluded, since the focus of the study was restricted to those operations that are directly in the sphere of banking, rather than on conglomeralisation.

Banks were divided into large, medium and small asset size in order to see whether size mattered to bank performance in the region. Large banks were classified as those with assets above US$252.7 million (top 25 percent of the sample) and small banks were classified as those with assets below US$45.5 million (lowest 25 percent of the sample). The in between range was classified as medium sized banks.

5.0 Implications of Size for the Performance of Banks

To gain insights into the relevance of size for explaining the performance of banks, the performance attributes were compared across small, medium-sized and large banks, first for the entire period and second, for sub-periods. The performance measures evaluated were profitability and operating unit costs. Profitability was measured in terms of the return on shareholders equity. Operating unit cost was measured in terms of the ratio of operating cost to total assets.

Table 2 : Bank Performance in the CARICOM 1990-1996- Tests for Equality of Means

Variables	Bank Size	Attributes (%)		Association between means	ANOVA F-Statistic
		Mean	Standard Deviation		
Return On Equity	All	13.7	27.2	L, M, S	6.8***
	Large (L)	12.7	19.3	L, M	3.4*
	Medium (M)	18.3	16	L, S	2.4
	Small (S)	5.2	26.2		
Operating Cost to Assets	All	4.4	1.5	L, M, S	1.6
	Large (L)	4.7	1.2		
	Medium (M)	4.2	1.8		
	Small (S)	4.4	1.3		

Notes: ***, ** and * indicates significance at a 1%, 5% and 10% level respectively. The null hypothesis is that the means are equal.

An examination of the results for the entire period, suggests that the scale of bank operations matters to profitability (See Table 2). The ANOVA F statistic shows a significant difference between all three bank sizes. Medium-sized banks turned out to realize significantly the highest level of profitability. In fact, the profitability of large banks was not significantly greater than small banks, despite the difference in means, owing to the wider variability in the performance of small banks.

In terms of operating efficiency, no significant difference between means of the various bank sizes was observed. The F test of the ANOVA test statistic did not reject the null hypothesis that the means are equal. The results suggest that the expansion in banking services in the region is not associated with the occurrence of lower operating unit cost.

The findings emanating from the overall results may mask changes in the performance of banks in relation to the scale of operations over time. An attempt was therefore made to check whether the results would remain consistent over time. Cross-sectional means of banks for the various years were graphed to observe the trend in their average performance.

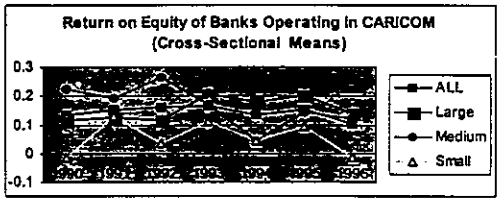

Figure 1

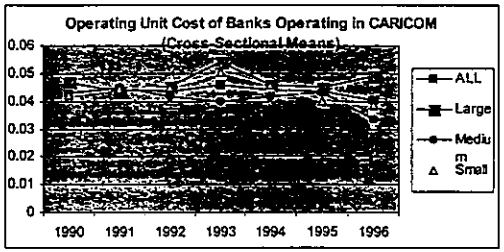

Figure 2

An inspection of Figures 1 and 2, reveals that medium-sized banks did not maintain the highest level of profitability over time. In fact, large and medium-sized banks exchanged positions as profitability leaders, while small banks consistently reflected lower average profitability. In terms of operating unit costs, there is no evidence of it been lower, as banks operate on a larger scale. Medium sized banks exhibited the lowest operating unit cost in most periods, while large banks exhibited the highest per-unit cost, though both patterns were not consistently maintained.

A closer look at the graphical displays, suggest that the relative performances of medium and large-sized banks were altered on or after 1993. To gain an idea of the comparative significance of the association

between the scale of bank operations and their performance over time, the sample was subdivided into two distinct periods, 1990-1993 and 1994 to 1996.

Table 3 : Bank Performance in the CARICOM 1990-993 Tests for Equality of Means

Variables	Bank Size	Attributes (%)		Association between means	ANOVA F-Statistic
		Mean	Standard Deviation		
Return On Equity	All	14.8	22	L, M, S	4.7***
	Large (L)	10.1	13.3	L, M	7.4***
	Medium (M)	21.1	17.2	L, S	0.2
	Small (S)	7.3	3.1		
Operating Cost to Assets	All	4.4	1.6	L, M, S	0.28
	Large (L)	4.6	1.3	L, M	
	Medium (M)	4.3	1.9	L, S	
	Small (S)	4.5	1.4	M, S	

Notes: ***, ** and * indicates significance at a 1%, 5% and 10% level respectively. The null hypothesis is that the means are equal.

Table 4: Bank Performance in the CARICOM 1994-1996 Tests for Equality of Means

Variables	Bank Size	Attributes (%)		Association between means	ANOVA F-Statistic
		Mean	Standard Deviation		
Return On Equity	All	12.4	18	L, M, S	3.6**
	Large (L)	15.2	23.9	L, M	0.005
	Medium (M)	14.9	13.7	M, S	9.7***
	Small (S)	2.1	14.9		
Operating Cost to Assets	All	4.3	1.4	L, M, S	2
	Large (L)	4.7	1.2	L, M	
	Medium (M)	4	1.6	L, S	
	Small (S)	4.2	1	M, S	

Notes: ***, ** and * indicates significance at a 1%, 5% and 10% level respectively. The null hypothesis is that the means are equal.

The ANOVA results suggest that while medium sized banks reflected the highest level of profitability in the first sub-period, its profitability in the second sub-period was not significantly different to that of large banks (See Tables 3 and 4). Furthermore, small banks did not perform significantly worse than large banks in the first sub-period. As such, there is not clear evidence, that scale of operations is critical to the profitability of banks operating in the region. Time specific events, such as expectations and the prevailing macroeconomic climate may play a more important role. For example, the higher profitability of large banks compared to medium-sized ones in the first sub-period, may have been due to the fact that the former operated in economies which underwent structural adjustments at the time. As such, macro economic conditions of the respective economies may have had a stronger influence on profitability than the scale of bank operations.

An examination of the results for the entire period, suggests that the scale of bank operations matters to profitability (See Table 2). The ANOVA F statistic shows a significant difference between all three bank sizes. Medium-sized banks turned out to realize significantly the highest level of profitability. In fact, the profitability of large banks was not significantly greater than small banks, despite the difference in means, owing to the wider variability in the performance of small banks.

In terms of operating efficiency, no significant difference between means of the various bank sizes was observed. The F test of the ANOVA test statistic did not reject the null hypothesis that the means are equal. The results suggest that the expansion in banking services in the region is not associated with the occurrence of lower operating unit cost.

The findings emanating from the overall results may mask changes in the performance of banks in relation to the scale of operations over time. An attempt was therefore made to check whether the results would remain consistent over time. Cross-sectional means of banks for the various years were graphed to observe the trend in their average performance.

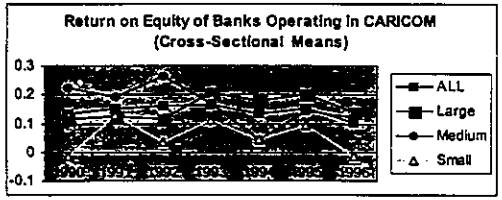

Figure 1

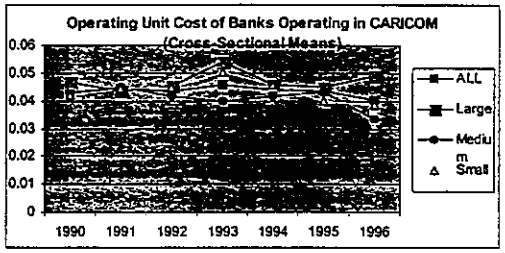

Figure 2

An inspection of Figures 1 and 2, reveals that medium-sized banks did not maintain the highest level of profitability over time. In fact, large and medium-sized banks exchanged positions as profitability leaders, while small banks consistently reflected lower average profitability. In terms of operating unit costs, there is no evidence of it been lower, as banks operate on a larger scale. Medium sized banks exhibited the lowest operating unit cost in most periods, while large banks exhibited the highest per-unit cost, though both patterns were not consistently maintained.

A closer look at the graphical displays, suggest that the relative performances of medium and large-sized banks were altered on or after 1993. To gain an idea of the comparative significance of the association

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Operating Cost to Assets	All	4.4	1.6	L, M, S	0.28
	Large (L)	4.6	1.3	L, M	
	Medium (M)	4.3	1.9	L, S	
	Small (S)	4.5	1.4	M, S	

Notes: ***, ** and * indicates significance at a 1%, 5% and 10% level respectively. The null hypothesis is that the means are equal.

Table 4: Bank Performance in the CARICOM 1994-1996 Tests for Equality of Means

Variables	Bank Size	Attributes (%)		Association between means	ANOVA F-Statistic
		Mean	Standard Deviation		
Return On Equity	All	12.4	18	L, M, S	3.6**
	Large (L)	15.2	23.9	L, M	0.005
	Medium (M)	14.9	13.7	M, S	9.7***
	Small (S)	2.1	14.9		
Operating Cost to Assets	All	4.3	1.4	L, M, S	2
	Large (L)	4.7	1.2	L, M	
	Medium (M)	4	1.6	L, S	
	Small (S)	4.2	1	M, S	

Notes: ***, ** and * indicates significance at a 1%, 5% and 10% level respectively. The null hypothesis is that the means are equal.

The ANOVA results suggest that while medium sized banks reflected the highest level of profitability in the first sub-period, its profitability in the second sub-period was not significantly different to that of large banks (See Tables 3 and 4). Furthermore, small banks did not perform significantly worse than large banks in the first sub-period. As such, there is not clear evidence, that scale of operations is critical to the profitability of banks operating in the region. Time specific events, such as expectations and the prevailing macroeconomic climate may play a more important role. For example, the higher profitability of large banks compared to medium-sized ones in the first sub-period, may have been due to the fact that the former operated in economies which underwent structural adjustments at the time. As such, macro economic conditions of the respective economies may have had a stronger influence on profitability than the scale of bank operations.

Operating unit cost did not vary significantly according to bank size, in any of the sub-periods (See Tables 3 and 4). Given the consistency of this result with what was obtained for the overall period, it does not seem to be the case that banks gain significant operating cost advantages by operating on a larger scale. Qualitative factors may play a more useful role in reducing operating unit costs.

5.1 Growth and Bank Performance

An important issue, concerns whether higher levels of asset expansion, are matched by improved bank performances. By expanding, banks can use their increased market power to derive greater profitability, or they can attain critical mass in order to afford quality resources. In addition, expansion in assets can afford banks the opportunity to improve their efficiency. The critical issue which surfaces, is how relevant is asset growth to securing improved performances by banks.

To undertake the analysis, asset changes were matched with profitability. Only data for which there were positive growth in assets were used, since it was felt that the deterioration of assets would signal a troubled bank.[9] For the purpose of this study, such banks would be considered outliers.

Asset Growth and Profitability

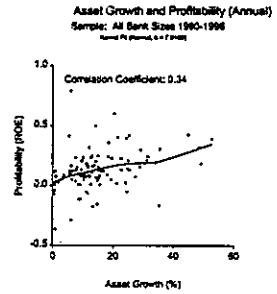

Figure 3

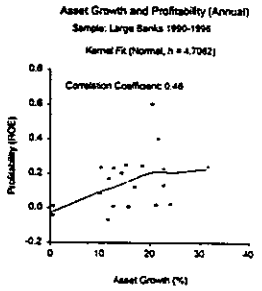

Figure 4

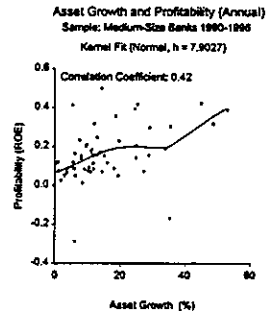

Figure 5

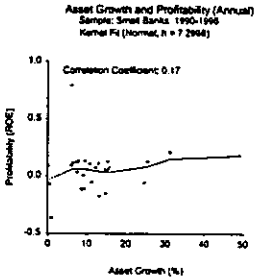

Figure 6

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[9] For example, negative asset growth could signal relatively high write-off of loans due to a significant proportion of loan delinquency in the bank asset portfolio. This may trigger an erosion in the capital base of these banks, as the pressure on shareholders to meet their liabilities increases in tandem with the decline in assets. In view of the decline in equity, such banks can artificially exhibit higher return on equity.

An examination of the scatter plots, suggests that overall there was a fairly positive association between asset growth and profitability (See Figures 3-6). The correlation was much weaker in the case of small banks. It would appear that while asset growth does not guarantee increased profitability, there may be some tendency in this direction, especially in the case of medium-sized and large banks. However, qualitative factors such as value added, human resources and management performance are expected to be of extreme importance.

6.0 Findings from the Econometric Study

The results obtained from the various models used in the econometric study were reported in Tables 1-4.

Table 1: Bank Performance and Competition Variables (Dynamic Fixed Effects)

	Dependent Variable		
	ROE_t (f^1)	NIM_t (f^2)	$OCAS_t$ (f^3)
MSA_{t-1}	-0.82	-0.10*	-0.04
BP_{t-1}	4327.00***		-105.34**
$OCAS_{t-1}$	-2.63	0.09	
LAS_{t-1}		6.39×10^{-3}	-6.27×10^{-3}
INF_{t-1}		1.20×10^{-4}	
R^2	66.04	73.3	71.19
F Stat	74.88***	69.55***	95.11***

Notes:***indicates significance at 1%, **indicate significance at 5% and *indicates at significance at 10%. Sample adjusted for White Heteroskedasticity-Consistent Standard Errors and Covariance

Table 2: Bank Performance and Competition Variables: Large Banks (Contemporaneous Fixed Effects)

Bank Size	Exp Var	Dependent Variable			
		ROE_t		NIM_t	$OCAS_t$
		f^4	f^5	f^6	f^7
Large Banks	MSA_t	-0.43		-0.11**	-0.06**
	$OCAS_t$	-10.55***		0.80**	
	BP_t	1359.49			
	INF_t		3.9×10^{-3}**	-7.67×10^{-3}	
	LAS_t		-0.08	0.02**	1.16×10^{-4}
	EQ_t		-0.01**		-4.4×10^{-5}
	$\overline{R}^2$	45.5	47.73	84.65	86.8
	F stat	45.48***	26.61***	60.64***	157.20***

Notes:***indicates significance at 1%, **indicate significance at 5% and *indicates at significance at 10%. Sample adjusted for White Heteroskedasticity-Consistent Standard Errors and Covariance

Table 3: Bank Performance and Competition Variables: Medium-sized Banks (Contemporaneous Fixed Effects)

Bank Size	Exp Var	Dependent Variable			
		ROE_t		NIM_t	$OCAS_t$
		f^4	f^5	f^6	f^7
Medium Size Banks	MSA_t	0.42		-0.11***	-0.05**
	$OCAS_t$	-3.75		0.45***	
	BP_t	1554.55***			
	INF_t		2.34×10^{-3}	-9.13×10^{-5}	
	LAS_t		-0.53***	6.39×10^{-3}	0.02*
	EQ_t		4.09×10^{-3}	71.05	-4.32^{-4}**
	$\overline{R}^2$	68.83		9.90×10^{31}	75
	F stat	77.28***	8.51×10^{31}***	99.69***	146.20***

Notes:***indicates significance at 1%, **indicate significance at 5% and *indicates at significance at 10%. Sample adjusted for White Heteroskedasticity-Consistent Standard Errors and Covariance. NIM regression is conducted using Generalised least squares.

Table 4: Bank Performance and Competition Variables: Small Banks (Contemporaneous Fixed Effects)

Bank Size	Exp Var	Dependent Variable			
		ROE_t		NIM_t	$OCAS_t$
		f^4	f^5	f^6	f^7
Small Size Banks	MSA_t	0.05		0.24***	0.16**
	$OCAS_t$	0.15		9.40×10^{-3}	
	BP_t	-766.8***			
	INF_t		-0.02	-7.82×10^{-4}	
	LAS_t		0.58***	0.07***	4.5×10^{-3}
	EQ_t		-0.02***		5.69×10^{-4}***
	$\bar{R}^2$	71.66	59.75	67.89	0.66
	F stat	6.54×10^{32}	40.14***	23.26***	49.78***

Notes:***indicates significance at 1%, **indicate significance at 5% and *indicates at significance at 10%. Sample adjusted for White Heteroskedasticity-Consistent Standard Errors and Covariance GLS applied to f^7 regression.

One of the primary interests of the study, concerned the applicability of the RMP hypothesis to the banking sector in the CARICOM. Clearly, the conditions for confirmation of the RMP hypothesis were not met in the dynamic relations, as market share was insignificant to profitability and negative though significant to the magnitude of the NIM(See Table 1, f^1 and f^2). In terms of scale of operations, market share turned out to be insignificant to profitability, regardless of the size category considered (compare Tables 2-4, f^4). Furthermore, market-share was positive and significantly related to the net interest margin, only in the case of small banks (compare Tables 2-4, f^6). There is insufficient evidence, therefore, to accept the RMP hypothesis with respect to small banks, as the RMP hypothesis was only partially satisfied for this size category. The RMP hypothesis was consequently rejected for this and other size categories.

Another concern of the study pertained to the efficiency hypothesis. The hypothesis was rejected in the dynamic regressions as operating unit cost turned out to be insignificant to profitability and market-share was insignificant to operating unit costs. In terms of size categories, the hypothesis was not rejected for large banks and it was partially rejected with respect to medium-sized banks. In the case of large banks, operating unit cost was negative and significant in its relation with profitability. (Compare Tables 2-4, f^4). Furthermore, market-share was significant and negatively related to operating unit cost, for this size category (compare Tables 2-4, f^5). The partial rejection of the efficiency hypothesis in the case of medium-sized banks stems from the non-significance of operating unit cost to profitability, despite the negative and significant relation between market share and operating unit cost. The hypothesis was completely rejected, however, in the case of small banks. The efficiency hypothesis seems, therefore, to be confirmed in the case of large banks, while the evidence is insufficient to confirm the hypothesis for the medium-sized banks.

Yet another area of concern of the study, relates to the importance of lending to the performance of banks. The evidence suggests that lending by small banks is significant to increasing their profitabitability, while it is not significant, in the case of large banks. Indeed, the volume of loans in the asset portfolio of banks turned out to be positive and significant, only for the profitability of small banks (compare Tables 2 to 4, f^5). The relationship was also significant for medium-sized banks, but the quality of the association was negative. The result emphasizes the dependency of small banks on the traditional business of lending, for the enhancement of their profitability. It appears, however, that large banks have been able to diversify their range of services to include other sources of revenue besides interest.

In terms of the impact of lending on operating unit costs, a positive and significant relation was found only with respect to the contemporaneous regressions for medium-sized banks. These banks appeared to be the only category size that incur rising operating unit costs, as they increase their lending (compare Tables 2-4, f^6). Moreover, these banks exhibited a negative and significant relationship between lending and profitability (compare Tables 2-4, f^5). The results suggest that these banks encounter rising transactions cost as they increase the frequency of their lending. Perhaps these institutions increase the resources dedicated to loans origination and recoveries as the frequency of their lending increases.

The study also sought to investigate whether the risk premium was significant in its impact on the magnitude of interest rate spreads. The loans to asset ratio was found to be significant and positively related to the net interest margin in the case of small and large banks, but not in the case of medium-sized banks (compare Tables 2-4, f^6). Exposure to credit risk therefore appears to play a significant role in influencing the interest rate spreads of small and large banks.

The modality of supply seems to have important consequences for the performance of banks. The results emanating from the lagged relationships suggest that the scale of branch network in the previous year is significant to profitability of the banks in the current year (compare Table 1, f^1). However, bank size seemed to matter, to the contemporaneous relation between the scale of branch net-work and profitability (Compare Tables 2-4, f4). It was not significant for large banks, but it was significance for small and medium-sized banks. The evidence suggests that small banks are likely to realise higher profitability levels through smaller branch networks. On the other hand, larger branch networks appeared to favour higher levels of profitability of medium-sized banks. The results therefore suggest that despite the developments of substitutes and more cost efficient modalities of supply of banking services, existing branches still remain relevant to the enhancement of shareholder returns.

The association between the equity multiplier and the performance of banks, was found to be specific to the scale of bank operations. In terms of profitability, the results suggest that increased capital strength of small and large banks are significant and complementary to higher levels of profitability (Compare Tables 2-4, f^5).[10] Contemporaneously, the relation suggests that management performance in generating return on assets, has been a significant contributor in generating increased shareholder's return for the small and large size categories.

The relation between the capital strength of banks and operating unit cost, was found to be specific to the scale of bank operations. The equity multiplier was not significant in the case of large banks, significant and positively related in the case of medium-sized banks and significant but negatively related in the case of small banks (compare Tables 2-4, f^7). Generalisations concerning this relationship therefore appeared to be difficult, but the evidence does not show a tradeoff between increased capitalisation and profitability.

[10] The negative relation between the equity multiplier and profitability, actually suggests a positive relation between an increase in share holder's equity and returns, given the definition of the variables.

The macro-economic parameter, inflation, was found to exhibit a significant association with profitability, only in the case of large banks (compare Tables 2-4, f). This is not a surprising result, considering that most of these banks are operating in territories that have floated their exchange rates and have reflected higher inflation rates relative to the rest of the region. On the other hand, the other bank sizes are located largely in territories with fixed exchange rates and very low inflation levels. Thus, it is plausible that large banks are more likely to factor in inflationary expectations in the supply of their services.

7.0 Conclusion

The scale of bank operations does not appear to matter to the relative performances of banks operating in CARICOM. Indeed, the differences in profitability between the various size categories did not remain robust to time. Furthermore, no significant difference was found in the mean operating unit cost per bank category size, regardless of time period considered.

While the scale of bank operations did not seem to matter, it mattered with respect to the significance of strategies to the performance of these banks. Most of the findings concerning the significance of strategies to the performances of banks were specific to bank size or the dynamic relation assumed. As such, the study shows differences in the significance of bank branches, operating unit cost, the volume of loans in the asset portfolio of banks and capitalisation for the performance of banks, according to the scale of bank operations.

Another important result obtained, concerns the relationship between asset growth and bank performance. The evidence suggests that asset growth is more likely to be associated with value-added services, rather than operating cost economies. Overall, asset growth exhibited a stronger association with increased profitability than with operating unit cost. There was a fair degree of positive association between asset growth and profitability in the cases of medium-sized and large banks. On the other hand, the association between asset growth and operating unit cost was quite low.

Interestingly, the evidence does not suggest that banks obtaining larger market share, would widen their interest rate spreads to the detriment of their customers. Indeed, the profitability of all size categories was found to be neutral to market share expansion. As such, the RMP hypothesis was rejected. Perhaps this result is symptomatic of the banking market being contestable, susceptible to competition from non-banks and foreign service providers.

The efficiency hypothesis was not rejected for large banks. The evidence suggests that large banks tend to use their increased market share to generate lower operating unit cost rather than increase their interest rate spreads. Also, lower operating unit cost was significant to their profitability. On the other hand, the efficiency hypothesis was rejected in the case of small and medium-sized banks. Improved cost efficiency did not appear to be significant to increasing profitability of these size categories. Profitability of these banks seemed more likely to increase through production of higher-value added services.

The findings should not be regarded as conclusive, since they are very much specific to the choice of assumptions. The study was conditioned on a sample, for which the division into various scales of operations was arbitrary. Moreover, results may be clouded by factors specific to different countries. Further studies of this nature, with variations in assumptions, using longer time periods and a more comprehensive sample, are needed.