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# RESEARCH DEPARTMENT

## WORKING PAPERS



DETERMINANTS OF COMMERCIAL BANKS INTEREST RATE  
SPREADS: SOME EMPIRICAL EVIDENCE FROM THE  
EASTERN CARIBBEAN CURRENCY UNION

by

**Kari H I Grenade**

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**EASTERN CARIBBEAN CENTRAL BANK**



**DETERMINANTS OF COMMERCIAL BANKS INTEREST RATE SPREADS:  
SOME EMPIRICAL EVIDENCE FROM THE EASTERN CARIBBEAN CURRENCY UNION**

KARI H. I. GRENADE\*

**ABSTRACT:**

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A trend analysis of commercial banks' interest rate spreads in the Eastern Caribbean Currency Union (ECCU) over the period 1993 to 2003 exposes two stylised facts. First, spreads have been strong and persistently showing little signs of narrowing and second, foreign owned banks have been operating with larger spreads compared to their indigenous counterparts. This study employs panel data techniques to measure the relevance of micro and macro factors in determining commercial banks' interest rate spreads over the period. The results indicate that the observed spreads can be attributed to the high level of market concentration, high operating costs and non-performing loans and the central bank's regulated savings deposit rate.

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## List of Abbreviations

<i>AUG</i>	-	<i>Anguilla</i>
<i>ANT</i>	-	<i>Antigua and Barbuda</i>
<i>DOM</i>	-	<i>Dominica</i>
<i>GREN</i>	-	<i>Grenada</i>
<i>MON</i>	-	<i>Montserrat</i>
<i>SKN</i>	-	<i>St Kitts and Nevis</i>
<i>SLU</i>	-	<i>Saint Lucia</i>
<i>SVG</i>	-	<i>St Vincent and the Grenadines</i>
<i>ECCU</i>	-	<i>Eastern Caribbean Currency Union</i>
<i>BDS</i>	-	<i>Barbados</i>
<i>TNT</i>	-	<i>Trinidad and Tobago</i>
<i>US</i>	-	<i>United States of America</i>
<i>UK</i>	-	<i>United Kingdom</i>

## 1.0 INTRODUCTION

The high interest rate spreads of the commercial banking industry in the currency union have emerged as a key public policy issue. Commercial banks are the main source of business funding in the ECCU, therefore, the level of interest rate spreads is an important policy variable. Interest rate spreads indicate how efficiently banks perform their intermediation role of savings mobilisation and allocation. Large interest rate spreads are deemed to be inimical to economic growth, as they act as a disincentive to private investment and otherwise constrain it to suboptimal levels. Inefficiencies in intermediation may emerge from structural problems: lack of adequate competition, scale diseconomies due to small market size or high fixed operating costs, the existence of regulatory controls, perceived market risks and the unsoundness of banks.

There are two approaches to measuring interest rate spreads. The ex- ante approach and the ex- post approach. The ex-ante interest rate spread is the difference between the contractual rates charged on loans and the rates paid on deposits. These are the rates that the public sees and are easily comparable across banks. The ex-post spread is the difference between the average rate charged on loans and the average rate paid on deposits. The average rate charged on loans is calculated by dividing total interest income received on loans and advances by the average stock of loans and advances, while the average rate paid on deposits is calculated by dividing total interest expense by the average stock of total deposits. The behaviour of both the ex-ante and the ex-post spreads is examined. In most empirical studies, the ex-post spread is the one commonly used as the dependent variable. Demirguc-Kunt et al (1999), argue that the ex-post spread is a more encompassing and useful measure because it controls for the fact that banks with high yields and risky credits are likely to face more defaults.

The purpose of this study is to provide an econometric account of some of the main determinants of the ex-post interest rate spreads of commercial banks. The paper uses pooled annual data of all the commercial banks operating in the ECCU over the period 1993 to 2003. This empirical analysis is the first step towards a serious and informed policy discussion on feasible options to narrow spreads. This paper extends the literature by including regulatory

variables and a market power variable to determine their influences on bank spreads in the ECCU. Additionally, determinants of interest rate spreads are analysed separately for the aggregate banking system and for the foreign and indigenous banks. Previous work done on ex-post interest rate spreads in the ECCU focussed on high operational costs through diseconomies of scale as the most relevant factor in determining bank spreads (Randall, 1998).

The paper is organised as follows; section 2 reviews the empirical literature while section 3 provides an overview of the developments in interest rate spreads in the ECCU over the study period. Section 4 describes the data while section 5 deals with the estimation techniques. Section 6 presents the empirical results, section 7 discusses the policy implications of the results and Section 8 concludes.

## **2.0 LITERATURE REVIEW**

The Hanson and Rocha (1986) study was one of the earliest investigations of the factors determining large spreads that began with the concern that a large spread was an impediment to financial intermediation. The thinking was that it discouraged potential savers with low returns on their savings and potential investors with reduced feasible investment opportunities. Using aggregate data of 29 countries over the period 1975 – 1983, Hanson and Rocha (1986) attributed high operating costs, financial repression, lack of competition and high inflation rates as the main causes of the high spread.

Chirwa et al (2004) used panel data techniques to investigate the causes of interest rate spreads in the commercial banking system of Malawi over the liberalised period of the 1990s. Their results show that high interest rate spreads were attributable to monopoly power, high reserve requirements, high central bank discount rate and high inflation. Demirguc-Kunt et al (1999) using bank level data for 80 industrial and developing countries over the period 1988-1995 show that differences in interest margins reflect a variety of determinants such as bank characteristics, macroeconomic conditions, explicit and implicit bank taxes and the overall financial structure.

Barajas et al (1998), examine the sources of high intermediation spreads observed in the Colombian banking sector over the pre liberalisation period (1974- 1988) and the post liberalisation period (1991-1996) and found mixed results. Liberalisation increased banking sector competitiveness, lowered market power and reduced financial taxation from its high 1970s level. The results also show bank spreads to be more responsive to non-financial costs (wages) and changes in loan quality. Afanassieff et al (2000), using panel data techniques to uncover the main determinants of bank spreads in Brazil, found that macroeconomic factors are the most relevant in explaining the spreads. Ramful (2001) in his study of the Mauritian banking sector found that interest rate spread was used not only to cover the cost of operating expenses and required reserves but also reflected the high degree of market power among banks and the poor quality of loans.

For the wider Caribbean, Moore and Craigwell (2000), using panel data techniques, empirically assessed some of the major determinants of commercial banks' spreads over the financially liberalised period of the 1990s and found that market power, provision for loan losses and real gross domestic product to be significant factors influencing bank spreads.

As it specifically relates to the ECCU, Randall (1998) devised two approaches to explain various determinants of interest rate spreads. In the first approach, using 24 quarterly observations for each of the countries over the period 1991-96, an accounting framework was formulated to decompose spreads into shares of various components. Using two-stage least squares methodology, the coefficients of parameters were obtained. However, her framework was purely descriptive and lacked any behavioural content, which she duly acknowledged. In the second approach Randall (1998) tested a set of variables, which were expected *a priori* to have an effect on the spread and found that operating costs were a key determinant of interest rate spreads accounting for 23 per cent of the estimated spread.

There has been very little empirical study done in the ECCU investigating the causes of large bank spreads since Randall (1998). This study attempts to fill this gap by bring the issue of large spreads to the fore once more with a view to stimulating discussion on measures that will cause interest rate spreads to narrow.



### 3.0 INTEREST RATE SPREADS IN THE ECCU: 1993 – 2003

This section presents an overview of the magnitudes of both ex-ante and ex-post spreads for the aggregate banking system as well as the foreign and indigenous banks over the study period.

#### 3.1 Ex-ante Spreads:

##### *i) Aggregate Banking System*

As table 1 shows, over the study period, ex-ante spreads for the ECCU as a whole have been persistently higher than those of the UK and USA averaging 7.6 percentage points compared with 2.5 and 2.8 percentage points for the UK and USA respectively. However, the issue of high spreads is not unique to the ECCU, as large spreads are also found in Trinidad and Tobago and Barbados.

*Table1: Ex-ante Spreads in the ECCU and Selected Countries  
(Percentage Points)*

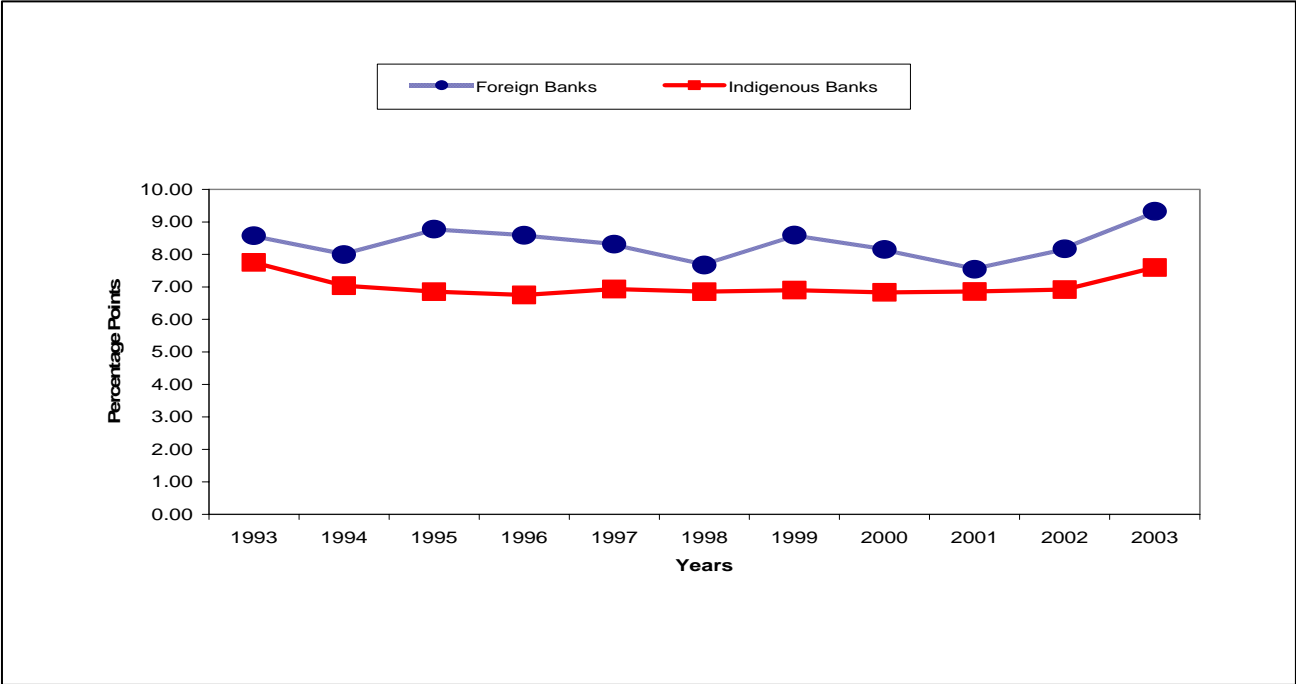
	AUG	ANT	DOM	GREN	MON	SKN	SLU	SVG	ECCU	BDS	TNT	US	UK
1993	9.8	8.8	8.2	7.9	10.1	6.6	8.5	8.1	8.2	5.8	6.9	2.8	2.0
1994	9.0	8.9	7.7	6.4	9.9	7.0	6.3	7.8	7.5	8.5	7.4	2.5	1.8
1995	8.5	8.1	7.3	6.7	9.8	6.8	8.5	7.0	7.8	5.9	8.3	2.9	2.6
1996	8.1	7.7	7.2	6.3	8.9	7.0	8.4	7.1	7.7	6.9	8.4	2.9	2.9
1997	7.5	7.4	6.7	7.5	9.9	7.2	8.1	7.2	7.6	7.6	9.1	2.8	3.0
1998	7.5	7.5	7.1	7.6	9.3	7.1	6.5	7.0	7.3	6.7	9.3	2.9	2.7
1999	7.5	7.6	8.1	7.3	8.2	6.9	8.3	7.0	7.7	6.7	9.3	2.7	n.a
2000	7.6	7.2	7.8	7.3	8.0	6.7	8.1	7.0	7.5	6.5	8.4	2.8	n.a
2001	7.3	7.1	7.0	5.9	8.2	7.0	8.0	7.3	7.2	6.9	9.3	3.2	n.a
2002	7.1	7.1	7.4	7.3	8.5	6.7	8.6	7.2	7.5	6.7	8.8	2.9	n.a
2003	7.6	8.5	8.3	8.5	9.3	7.9	8.5	7.5	8.3	6.7	8.8	2.9	n.a

Sources: Eastern Caribbean Central Bank  
IMF IFS CD Rom, (September 2004)  
n.a means not available

Table 1 shows that over the review period ex-ante spreads were most pronounced in Montserrat with spreads averaging 9.1 percentage points, followed by Anguilla, 8.0 percentage points. Average ex-ante spread was the lowest in Grenada (7.0 percentage points) followed by St Kitts and Nevis with 7.1 percentage points. In some countries ex-ante spreads fluctuated quite a bit. The rate of variation was most outstanding in Grenada and Saint Lucia. In Grenada, spreads fell from 7.9 percentage points in 1993 to 5.9 percentage points in 2001 increasing again to 8.5 percentage points in 2003. In Saint Lucia’s case, spreads declined from 8.5 percentage points in 1993 to 6.5 percentage points in 1997 and rose again to 8.6 percentage points in 2002. For the other ECCU countries, the differences in the deposit and loans rates, though striking, did not vary as much.

*ii) Foreign versus Indigenous Banks*

*Figure 1: Ex-ante Spreads - Foreign versus Indigenous Banks*



*Table 2A: Ex-ante Spreads in the ECCU – Foreign versus Indigenous Banks  
(Percentage Points)*

	AUG						ANT						DOM						GREN					
	FR			IN			FR			IN			FR			IN			FR			IN		
	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S
1993	2.9	10.1	7.2	3.4	14.0	10.7	2.9	11.0	8.1	5.1	13.4	8.3	3.3	12.6	9.3	4.2	10.5	6.4	3.2	10.3	7.1	4.0	12.4	8.5
1994	3.1	10.5	7.4	4.0	13.3	9.3	1.5	9.1	7.5	5.2	13.3	8.2	3.6	11.9	8.3	4.3	11.0	6.6	3.2	10.7	7.5	3.9	9.6	5.6
1995	2.6	11.4	8.8	3.9	12.2	8.4	1.7	7.5	5.8	4.9	12.2	7.3	3.8	11.7	7.9	4.3	10.5	6.3	3.5	10.5	7.1	4.0	10.3	6.4
1996	3.6	11.8	8.2	3.9	12.0	8.1	1.7	7.7	5.9	5.0	12.1	7.1	3.9	11.6	7.7	4.5	10.8	6.3	3.5	10.1	6.5	3.9	10.1	6.1
1997	3.8	12.0	8.2	4.0	11.6	7.5	2.1	7.9	5.7	5.1	11.6	6.5	4.1	11.5	7.5	4.3	9.6	5.3	3.8	10.3	6.5	4.1	12.3	8.2
1998	4.1	12.2	8.1	3.9	11.4	7.5	2.5	9.0	6.5	5.1	11.8	6.7	3.8	11.6	7.8	4.2	10.1	5.9	4.0	11.1	7.1	4.4	12.3	7.9
1999	4.6	12.1	7.5	3.9	11.4	7.5	2.1	9.6	7.5	5.3	11.9	6.7	3.6	11.9	8.3	3.9	11.8	7.9	4.0	11.0	7.0	4.6	12.2	7.6
2000	4.6	12.1	7.5	3.8	11.4	7.6	3.0	9.6	6.6	5.4	12.1	6.7	3.7	12.3	8.5	4.3	10.8	6.5	3.9	10.6	6.7	4.5	12.2	7.7
2001	4.4	12.8	8.3	3.5	10.7	7.1	2.3	8.6	6.3	5.3	12.4	7.1	3.7	11.3	7.6	4.4	10.5	6.2	3.8	7.4	3.7	4.5	12.0	7.6
2002	4.2	12.4	8.3	3.4	10.5	7.1	2.5	9.4	6.9	5.3	12.1	6.8	3.4	11.6	8.2	3.9	10.0	6.1	2.8	9.1	6.3	3.5	11.5	8.0
2003	4.4	12.5	8.1	4.1	10.8	6.7	2.7	9.8	7.2	5.5	13.2	7.6	3.4	11.9	8.5	3.6	11.6	8.0	3.3	13.4	10.0	3.5	11.8	8.3

Source: Eastern Caribbean Central Bank

D = Weighted Average Deposit Rate

L = Weighted Average Lending Rate

S = Ex-ante Spread

FR= Foreign Branch Banks

IN=Indigenous Banks

*Table 2B: Ex-ante Spreads in the ECCU – Foreign versus Indigenous Banks  
(Percentage Points)*

	MON						SKN						SLU						SVG					
	FR			IN			FR			IN			FR			IN			FR			IN		
	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S
1993	2.8	13.4	10.5	2.8	13.4	10.5	3.2	11.3	8.0	4.7	10.0	5.3	3.7	12.6	8.9	3.8	11.6	7.7	3.3	12.4	9.1	4.3	11.6	7.4
1994	2.9	13.2	10.3	2.9	13.2	10.3	3.2	11.9	8.7	4.7	10.2	5.6	3.7	9.4	5.7	4.5	11.6	7.1	3.3	12.5	9.1	4.3	11.2	6.9
1995	2.2	12.6	10.4	2.2	12.6	10.4	3.2	11.6	8.4	4.7	10.1	5.4	3.9	13.1	9.2	4.6	12.1	7.5	3.5	11.9	8.4	4.5	10.7	6.2
1996	3.0	12.5	9.5	3.9	11.6	7.8	3.3	11.8	8.5	4.6	10.3	5.7	4.3	13.4	9.2	5.0	12.2	7.2	3.6	11.8	8.2	4.5	10.8	6.4
1997	2.7	13.1	10.4	2.3	11.2	8.9	3.6	11.8	8.2	4.6	10.8	6.2	4.4	13.3	8.8	4.9	12.0	7.1	3.8	12.0	8.2	4.5	11.0	6.5
1998	2.9	12.8	9.9	2.6	11.2	8.6	3.4	12.2	8.8	5.0	10.5	5.5	4.6	10.6	6.0	4.9	12.0	7.1	4.1	12.2	8.1	4.6	10.8	6.2
1999	3.0	12.2	9.3	3.6	11.1	7.5	3.5	12.3	8.8	5.0	10.4	5.4	4.7	13.8	9.2	4.9	12.1	7.2	4.6	12.1	7.5	4.6	11.2	6.6
2000	3.2	12.3	9.1	3.7	11.1	7.5	3.5	12.4	8.8	4.8	10.1	5.3	4.9	13.8	8.9	5.0	12.2	7.1	4.6	12.1	7.5	4.4	11.0	6.6
2001	3.0	13.2	10.2	3.8	11.1	7.3	3.4	12.1	8.6	4.6	10.4	5.8	4.6	13.6	9.1	5.0	11.8	6.8	4.4	12.8	8.3	4.6	11.1	6.6
2002	2.2	11.9	9.6	3.2	11.3	8.1	2.4	10.9	8.5	4.7	10.1	5.4	3.2	13.2	10.0	4.4	11.6	7.2	4.2	12.4	8.3	4.2	10.7	6.4
2003	2.1	14.7	12.6	3.4	12.0	8.6	2.8	12.0	9.2	4.9	12.1	7.2	3.6	13.6	10.0	9.6	17.3	7.7	4.4	12.5	8.1	4.6	11.7	7.1

Source: Eastern Caribbean Central Bank

D = Weighted Average Deposit Rate

L = Weighted Average Lending Rate

S = Ex-ante Spread

FR = Foreign Branch Banks

IN = Indigenous Banks

As shown in figure 1, over the study period foreign banks in the ECCU had consistently higher spreads than their indigenous counterparts. As tables 2A and 2B show, these higher spreads were most evident in six of the eight ECCU countries. For example, interest rate spreads of the foreign banks in Dominica averaged 8.1 percentage points as compared with 6.5 percentage points for the indigenous banks. In St Kitts and Nevis, spreads averaged 8.6 percentage points for the private banks, some 2.9 percentage points higher than the indigenous banks.

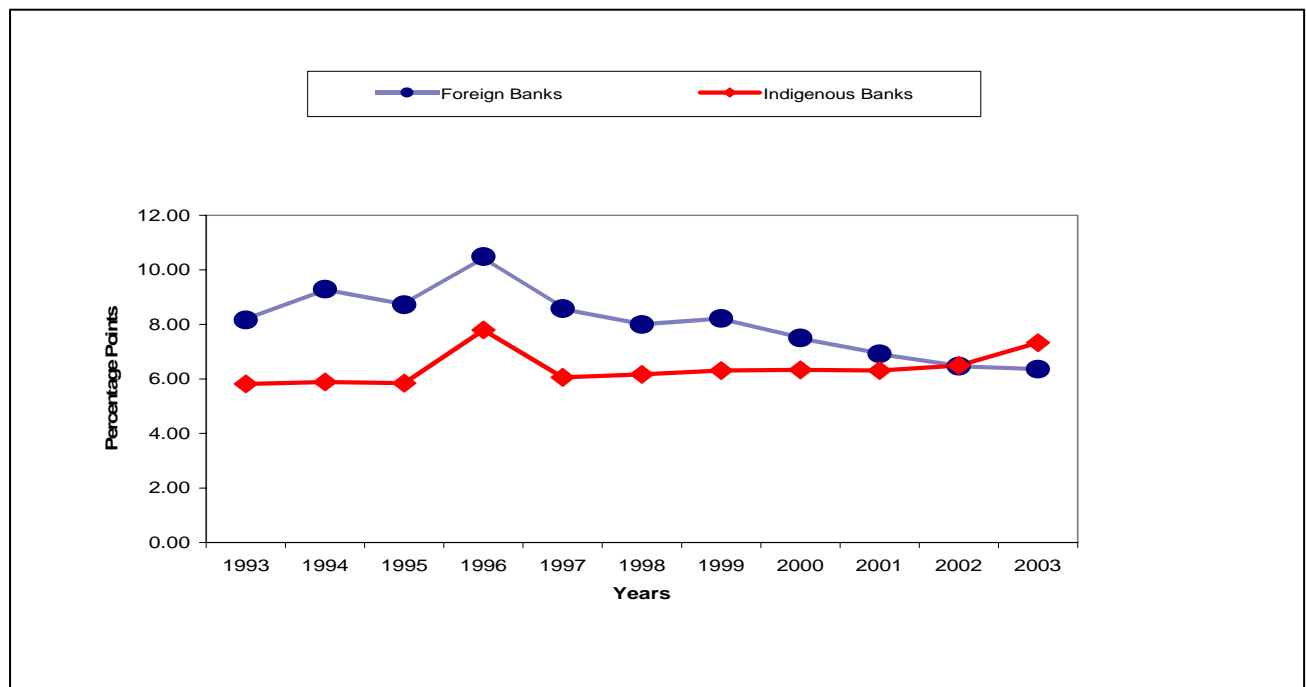
### 3.2 Ex-post Spreads:

#### *i) Aggregate Banking System*

Over the study period interest rate spreads as measured ex-post showed a bit more fluctuation than the ex-ante spreads. Montserrat experienced the greatest rate of variation with spreads decreasing from 7.1 percentage points in 1993 to 2.4 percentage points in 1998 and rising again to 7.1 percentage points in 2002. On average, over the study period ex-post spreads ranged from 7.3 percentage points in Antigua and Barbuda to 6.1 percentage points in Montserrat.

#### *ii) Foreign vs Indigenous Banks*

*Figure 2: Ex-post Spreads - Foreign versus Indigenous Banks*



As shown in figure 2, for the ECCU as a whole up until 2002, ex-post spreads for the foreign banks were generally higher than those of the indigenous banks. Foreign banks tended to have

higher spreads overall than their indigenous counterparts. However, from 1997, the trend exhibited is that of a narrowing of the foreign banks' spread and a widening of those of the indigenous banks. This could have been as a result of the entry of Trinidadian banks to the banking system. Tables 3A and 3B show the magnitude of the spread in each country for both the foreign and indigenous banks.

Table 3A: *Ex-Post Spreads in the ECCU – Foreign versus Indigenous Banks*  
(Percentage Point)

	AUG						ANT						DOM						GREN					
	FR			IN			FR			IN			FR			IN			FR			IN		
	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S
1993	4.3	10.0	5.7	4.9	11.4	6.5	3.5	12.7	9.2	5.9	12.6	6.7	3.7	12.1	8.3	4.3	12.0	7.6	3.0	10.2	7.2	4.2	10.8	6.6
1994	2.6	11.1	8.5	4.3	12.2	7.9	3.1	13.1	10.0	5.2	11.7	6.5	3.4	11.6	8.1	4.1	12.0	7.9	2.7	11.1	8.4	3.7	10.6	6.8
1995	3.1	10.9	7.9	4.1	12.3	8.2	3.2	12.5	9.4	5.1	12.2	7.1	2.8	10.0	7.2	3.8	6.0	2.2	3.5	13.1	9.6	3.8	10.6	6.9
1996	2.8	14.6	11.8	2.5	11.8	9.4	3.0	15.1	12.1	3.9	11.2	7.3	3.7	12.9	9.2	2.3	11.3	9.0	3.9	15.9	12.0	2.6	10.9	8.4
1997	4.2	13.7	9.5	3.9	10.8	6.9	3.3	11.7	8.4	5.1	11.3	6.2	4.8	12.6	7.8	4.2	10.3	6.0	3.4	10.4	7.1	3.7	10.3	6.6
1998	4.2	11.9	7.7	3.8	10.5	6.7	3.9	12.3	8.4	5.1	11.1	6.0	5.3	13.1	7.8	4.2	10.5	6.3	4.5	12.8	8.2	4.1	10.8	6.7
1999	4.2	11.5	7.3	3.7	11.0	7.3	3.9	11.9	8.0	5.2	11.0	5.8	4.8	12.7	7.9	4.2	10.2	5.9	3.7	10.2	6.5	4.3	11.7	7.4
2000	4.7	11.7	7.1	3.7	11.0	7.3	4.8	12.3	7.5	5.6	11.5	5.8	4.5	11.5	7.1	3.9	10.2	6.3	3.9	10.3	6.4	4.1	10.9	6.8
2001	4.5	10.6	6.1	3.7	11.3	7.6	4.1	11.3	7.1	5.5	11.1	5.6	3.9	10.1	6.2	4.3	9.9	5.6	4.2	10.2	6.0	4.2	10.9	6.7
2002	3.9	9.8	5.9	3.1	9.7	6.5	3.4	10.3	7.0	5.6	11.4	5.8	4.4	9.8	5.4	4.2	9.0	4.8	3.5	9.8	6.3	3.9	10.7	6.8
2003	2.9	9.4	6.5	3.7	9.9	6.1	3.0	9.3	6.3	6.4	12.2	5.8	4.0	9.4	5.4	3.3	9.0	5.7	3.4	10.4	7.0	3.1	10.3	7.2

Source: Eastern Caribbean Central Bank

D = Weighted Average Deposit Rate

L = Weighted Average Lending Rate

S = Ex-post Spread

FR=Foreign Branch Banks

In=Indigenous Banks

*Table 3B: Ex-Post Spreads in the ECCU – Foreign versus Indigenous Banks  
(Percentage Point)*

	MON						SKN						SLU						SVG					
	FR			IN			FR			IN			FR			IN			FR			IN		
	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S
1993	3.0	10.7	7.7	6.4	12.0	5.6	4.0	11.8	7.8	4.6	9.3	4.7	4.4	13.7	9.3	3.4	8.1	4.6	4.2	14.4	10.2	3.3	7.5	4.1
1994	3.0	13.0	10.0	2.7	6.6	3.9	2.9	11.5	8.6	4.4	9.5	5.1	2.9	13.0	10.1	3.2	8.2	5.0	3.2	13.7	10.5	3.1	7.2	4.1
1995	2.2	12.0	9.8	2.9	8.9	6.0	3.1	11.1	8.0	4.7	10.0	5.3	3.7	12.5	8.8	3.5	8.2	4.7	3.2	12.3	9.1	4.7	11.3	6.5
1996	3.1	11.9	8.8	3.1	9.8	6.7	2.5	12.5	10.0	3.5	9.6	6.0	3.1	12.5	9.5	4.3	12.5	8.2	2.8	14.6	11.8	3.1	10.6	7.5
1997	3.4	6.6	3.3	3.5	8.9	5.4	3.4	14.8	11.3	4.6	9.6	5.1	4.1	12.5	8.4	4.9	11.0	6.1	4.2	13.7	9.5	4.3	9.6	5.3
1998	2.3	3.2	0.9	2.7	6.8	4.1	4.7	12.4	7.7	4.8	10.3	5.5	4.6	12.6	8.0	4.9	11.1	6.2	4.2	11.9	7.7	4.4	10.0	5.6
1999	1.7	3.4	1.7	3.2	8.4	5.2	4.8	15.8	11.0	4.9	10.3	5.3	4.7	12.6	8.0	4.9	11.2	6.3	4.2	11.5	7.3	4.5	10.5	6.0
2000	1.4	2.6	1.2	3.5	9.6	6.1	4.1	13.4	9.3	4.9	11.0	6.1	4.9	12.3	7.3	5.0	11.0	6.0	4.7	11.7	7.1	4.4	10.4	6.0
2001	1.0	3.2	2.2	3.5	9.7	6.2	2.9	11.2	8.3	4.8	11.4	6.6	4.9	11.8	6.9	5.2	11.4	6.2	4.5	10.6	6.1	4.5	9.8	5.3
2002	0.9	10.0	9.1	3.1	9.8	6.6	2.9	9.8	6.9	4.7	11.8	7.0	3.8	10.1	6.3	5.1	11.1	5.9	3.9	9.8	5.9	6.7	14.2	7.5
2003	1.8	13.0	11.1	2.4	8.4	6.0	2.1	10.1	7.9	5.4	16.2	10.8	2.9	9.3	6.3	3.9	11.0	7.1	2.9	9.4	6.5	5.4	13.1	7.7

Source: Eastern Caribbean Central Bank

D = Weighted Average Deposit Rate

L = Weighted Average Lending Rate

S = Ex-post Spread

FR=Foreign Branch Banks

In=Indigenous Banks

There are possible explanations for spreads being higher for the foreign banks than for their indigenous counterparts. Indigenous banks have traditionally catered to the small depositors and small businesses. In order to attract new depositors, indigenous banks would have had to offer very competitive rates. In addition, because of state involvement in these banks, credit may have been extended at interest rates below market value.

#### 4.0 DATA SOURCES AND MEASUREMENT

Annual data of all the commercial banks operating in the ECCU during the period 1993 to 2003 are used in this study. All data were sourced from the Central Bank's database. Included in the data set are proxies of the following hypothesised determinants of commercial banks ex-post interest rate spreads:

Table 4: Key Variables and the Expected Impact on Interest Rate Margin

<i>Variable</i>	<i>Proxy</i>	<i>Predicted Coefficient Sign</i>	<i>Rationale</i>
<i>Regulated saving deposit rate</i>	<i>RSD: <math>\frac{\text{saving deposits}}{\text{Total deposits}}</math></i>	<i>Positive</i>	$RSF \uparrow \Rightarrow \text{cost} \uparrow \Rightarrow \text{Margins} \uparrow$
<i>Opportunity cost of non-interest bearing reserves</i>	<i>RR: non-interest bearing reserves</i>	<i>Positive</i>	$RR \uparrow \Rightarrow \text{Opportunity cost} \uparrow \Rightarrow \text{Margins} \uparrow$
<i>Liquidity risk</i>	<i>LIQ: <math>\frac{\text{Liquid assets}}{\text{Total assets}}</math></i>	<i>Negative</i>	$LIQ \uparrow \Rightarrow \text{Liquidity risk} \downarrow \Rightarrow \text{Margins} \downarrow$
<i>Operating efficiency</i>	<i>OC: <math>\frac{\text{Operating costs}}{\text{Total earning assets}}</math></i>	<i>Positive</i>	$OC \uparrow \Rightarrow \text{Operating efficiency} \downarrow \Rightarrow \text{Margins} \uparrow$
<i>Provision for loan losses</i>	<i>PL: <math>\frac{\text{Provision for loan losses}}{\text{Total earning assets}}</math></i>	<i>Positive</i>	$PL \uparrow \Rightarrow \text{Cost of bad debts write offs} \uparrow \Rightarrow \text{Margins} \uparrow$
<i>Economic activity</i>	<i>EA: Real GDP growth</i>	<i>Negative</i>	$EA \uparrow \Rightarrow \text{risk of loan defaults} \downarrow \Rightarrow \text{Margins} \downarrow$
<i>Market power</i>	<i>MP: Herfindahl Index</i>	<i>Positive</i>	$MP \uparrow \Rightarrow \text{Competition} \downarrow \Rightarrow \text{Margins} \uparrow$



*i) Regulatory Variables:*

Since the establishment of the Eastern Caribbean Central Bank (ECCB) in 1983, commercial banks have been subjected to regulatory controls, two of which are the interest rate floor on saving deposits and the reserve requirements.

*a) The regulated savings deposit rate*

Following Randall (1998), this variable is proxied by the share of savings deposits to total deposits. The higher the share of savings deposits to total deposits the greater the rigidities imposed on banks' cost structure through the statutory minimum savings deposit rate. A priori, this variable is expected to be positively associated with bank spreads. The hypothesis is that the floor on savings could be binding i.e set above equilibrium and as such, could create a situation of excess supply. In other words, the regulated interest rate on savings deposits may have exerted upward pressure on loan rates and in turn bank spreads by encouraging a propagation of deposits and as such, adding to the operating costs of banks.

From January 1985 until August 2002, the ECCB had prescribed a 4 percent minimum on savings deposits. This rate was reduced by one percentage point in September 2002 and has been at that reduced rate since. The policy to regulate the savings rate was geared to assist financial intermediation and to reward and encourage savings by depositors and also to ensure that the real savings rate that depositors received on their investment was positive.

*b) The reserve requirements*

Commercial banks are required to maintain a certain percentage of total deposits and other similar liabilities to which reserve ratios are made applicable, as the Monetary Council may determine from time to time. Whereas reserve requirements are used as monetary policy instruments to ensure the safety and soundness of the banking system, these non-interest bearing reserves in essence impose an implicit financial tax on banks thereby reducing commercial banks revenues. Banks can either pass on this loss of revenue to depositors, who will receive lower interest rates on deposits, or they can pass it on to borrowers who will face

higher interest rates on loans, thereby increasing the spread between the two rates. Over the study period, the reserve requirement ratio remained unchanged at six per cent. However, because the reserve ratio is applied to total deposits at a point in time, the dollar amount that each bank holds with the Central Bank would be different, thus allowing for some variation in the empirical estimations. As a priori, the sign on this variable is expected to be positive.

*ii) Liquidity Risk*

Where there is excess liquidity in the banking system, banks' exposures to liquidity risks is low and this should contribute to lowering spreads. Liquidity risk is proxied by the ratio of liquid assets to total assets. The expected sign is negative. Brock and Franken (2002) found that bank liquidity was associated with lower spreads in Chile.

*iii) Bank –Specific Variables*

The operating costs and the quality of loans portfolio of the commercial banks are the two bank specific variables included in the data set.

*a) Operating costs*

Operating costs arise in processing loans and the servicing of deposits. They are proxied by the ratio of total operating costs to total earning assets. For the aggregate banking system, on average, the operating cost as a proportion of total earning assets ranged from 3.0 per cent in St Kitts and Nevis to 4.7 per cent in Antigua and Barbuda. As it relates to the foreign banks, five of the eight countries recorded ratios of over 4.0 per cent on average. Indigenous banks recorded ratios ranging from 2.2 per cent in St Kitts and Nevis to 5.3 per cent in Antigua and Barbuda on average. According to Moore and Craigwell (2000), international standards normally identify 3.6 per cent as an average, suggesting that the commercial banks in the ECCU operate with relatively high intermediation costs. A positive relationship between this variable and bank spreads is expected.

*b) Loan loss provisioning*

The ratio of provision for loan losses to total earning assets is used as the proxy for quality of loans across countries. For the aggregate banking system, on average, this ratio of provision

for loan losses to total earning assets ranged from 0.2 per cent in Grenada, Anguilla and St Kitts and Nevis to 2.6 per cent in Montserrat over the study period. As it relates to the foreign and indigenous banks, ratios tended to be similar on average except in Antigua and Barbuda and Montserrat where the ratio of provision for losses to total earning assets was significantly higher for the foreign banks. This may be attributed to the elevated provision for loan losses following the volcanic eruption in Montserrat and the devastating hurricanes in Antigua and Barbuda in the mid-nineties. It may also be the case that the indigenous banks in those countries applied lower standards. A priori, a positive relationship is expected between this variable and bank spreads reflecting the notion that banks tend to push the cost of non-performing loans to customers.

*iv) Economic activity*

From a theoretical standpoint there is positive relationship between economic activity and banks spreads. As the economy expands, the demand for loans increases and this in turn can lead to higher lending rates, which can serve to widen spreads. However, empirical studies have found mixed results. Randall (1998) in her study of the ECCU found a negative relationship between economic activity and bank spreads while Moore and Craigwell (2000) in their study of selected CARICOM countries found a positive relationship. Randall's rationale for the negative relationship was that as small open economies, the countries of the ECCU are exposed to external shocks and are vulnerable to hurricanes and other natural disasters. These negative economic shocks can seriously affect the banking industry by escalating the total amount of bad debts in the system. This in turn can exert upward pressure on lending rates and in turn, banks' spread (i.e. as incomes fall spreads rise). Moore and Craigwell (2000) explained that as incomes expand, the demand for loans increases and this in turn may push up lending rates and consequently bank spreads. Economic activity is proxied by the growth rate of real gross domestic product. Within the ECCU context, the expected sign is negative.

*v) Market power variable*

The structure of the market in which banks operate plays an important role in influencing bank spreads. Economic theory posits that competitive pressures that result from conditions of free entry and competitive pricing will raise the efficiency of intermediation by decreasing the

spreads between deposits and lending rates. Recent empirical studies, Chirwa et al (2004), tend to support the hypothesis that interest rate spreads are positively related to market power. That is, the more concentrated the banking industry (i.e. the less competitive) the higher the banks' spreads.

This study uses the Herfindahl–Hirschman index (HHI) as the measure of market power in the banking system in each of the ECCU countries both at the aggregate level and for the foreign and indigenous banks. The HHI index is a commonly accepted measure of market concentration. Two factors go into the construction of the index, the number of firms in the industry and each firm's market share. The fewer the number of firms in the industry the easier it is for them to coordinate higher prices. Similarly, the greater the market share that a firm possesses the easier it is for that firm to set higher prices. The index is calculated by squaring the market share of each firm competing in the market and then summing up the resulting numbers. The HHI is expressed as:

$$H = \sum_{i=1}^n x_i^2$$

Where,  $x_i$  is the market share of firm  $i$  and  $n$  is the number of firms. In this particular context, the market share of each bank is calculated as its portion of loans and advances to the total industry's loans and advances in its respective country. The HHI can range from close to zero to one. According to the international standard, a result of less than 0.1 is considered to be a highly competitive market, a result of 0.1 to 0.18 is considered moderately concentrated and a result that is greater than 0.18 is considered highly concentrated.

As exhibited in figure 3, over the study period, on an aggregate level, in each of the ECCU countries the value of the HHI has remained virtually unchanged reflecting a highly concentrated industry within each country. Notable exceptions are Antigua and Barbuda and to a lesser extent Saint Lucia. However, when the analysis is dissected as shown in table 4 the level of concentration that exists among the foreign banks is extremely low reflecting an

almost perfectly competitive system unlike that of the indigenous banks where there appears to be a heavy level of concentration.

Figure 3: HHI – Total Banking Sector

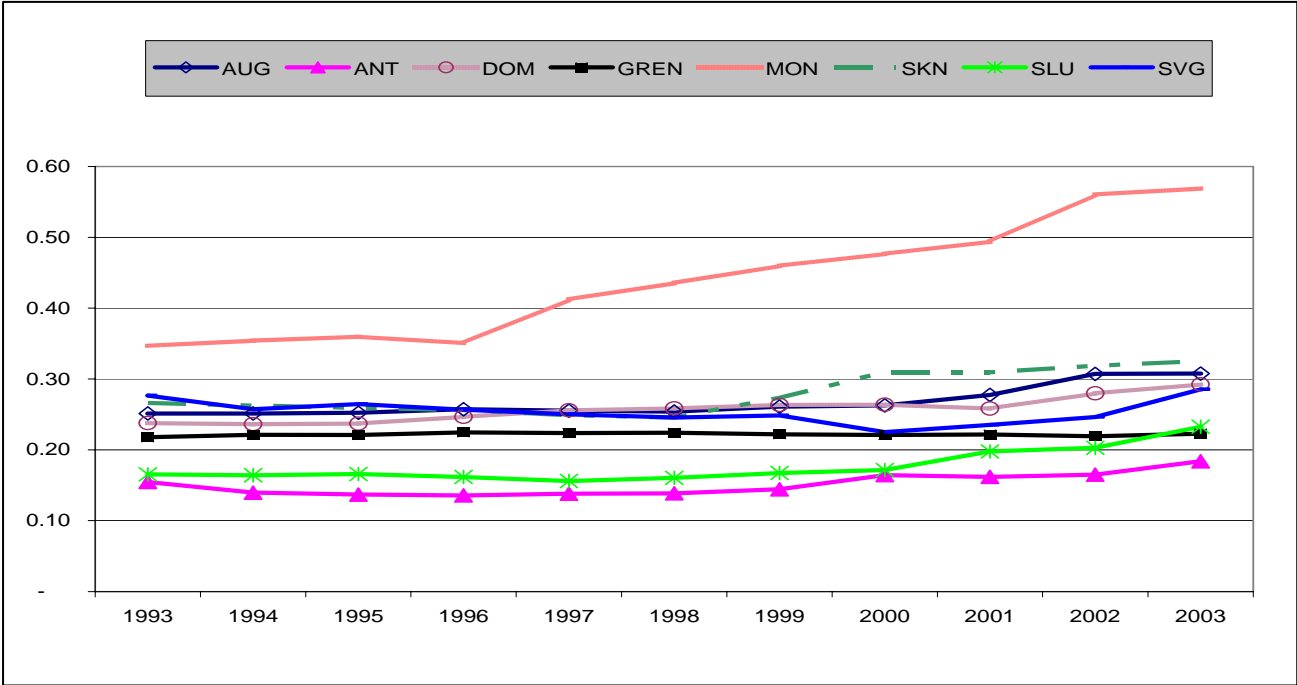


Table 4: The HHI - Foreign and Indigenous Banks

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Anguilla</b>											
Foreign Banks	0.07	0.05	0.05	0.04	0.04	0.04	0.03	0.03	0.02	0.01	0.02
Indigenous Banks	0.19	0.20	0.21	0.22	0.21	0.21	0.23	0.23	0.26	0.29	0.29
<b>Antigua &amp; Barbuda</b>											
Foreign Banks	0.06	0.04	0.04	0.05	0.06	0.06	0.08	0.10	0.09	0.08	0.11
Indigenous Banks	0.10	0.10	0.10	0.09	0.08	0.08	0.06	0.07	0.07	0.08	0.07
<b>Dominica</b>											
Foreign Banks	0.11	0.10	0.10	0.09	0.09	0.09	0.10	0.10	0.10	0.09	0.08
Indigenous Banks	0.13	0.13	0.14	0.16	0.17	0.17	0.17	0.17	0.15	0.19	0.21
<b>Grenada</b>											
Foreign Banks	0.09	0.08	0.08	0.08	0.09	0.08	0.08	0.08	0.08	0.07	0.06
Indigenous Banks	0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.15	0.16
<b>Montserrat</b>											
Foreign Banks	0.28	0.27	0.27	0.19	0.20	0.20	0.18	0.16	0.14	0.11	0.10
Indigenous Banks	0.07	0.08	0.09	0.16	0.21	0.23	0.28	0.32	0.35	0.45	0.47
<b>St Kitts &amp; Nevis</b>											
Foreign Banks	0.09	0.10	0.10	0.09	0.10	0.09	0.09	0.07	0.07	0.08	0.07
Indigenous Banks	0.17	0.17	0.16	0.17	0.15	0.16	0.19	0.24	0.24	0.24	0.26
<b>Saint Lucia</b>											
Foreign Banks	0.09	0.09	0.08	0.08	0.07	0.07	0.07	0.06	0.05	0.05	0.08
Indigenous Banks	0.08	0.08	0.09	0.08	0.08	0.09	0.10	0.11	0.15	0.15	0.15
<b>St Vincent &amp; Grenadines</b>											
Foreign Banks	0.05	0.04	0.04	0.04	0.03	0.03	0.03	0.04	0.03	0.03	0.09
Indigenous Banks	0.23	0.22	0.23	0.22	0.22	0.21	0.22	0.19	0.20	0.22	0.19

## 5.0 ESTIMATION TECHNIQUES

Panel data models are usually estimated using either pooled ordinary least squares (OLS), fixed effects or random effects. As cited in Ramful (2001), the latter two techniques have been developed to handle the systematic tendency of individual specific components to be different for some units. In this study, all three estimation techniques are carried out, however, the pooled OLS and random effects estimates<sup>2</sup> were not as robust as the fixed effects estimates; hence a fixed effect model is utilised. Demirguc-Kunt et al (1999) point out that while it is possible to estimate panel models using OLS, the conditions under which OLS will produce consistent estimates are limited and unlikely to be met in practice. Pooled OLS assumes a constant slope and intercept across all countries. However, the fixed effects model

<sup>2</sup> Results not reported

involves the recognition that this assumption may be unreasonable. Dummy variables are therefore introduced to allow the intercept term to vary over time and across countries. The fixed effects model takes the following form:

$$I_{ijt} = \beta_0 + \beta_1 RS_{ijt} + \beta_2 RR_{ijt} + \beta_3 OC_{ijt} + \beta_4 PL_{ijt} + \beta_5 MP_{jt} + \beta_6 GDP_{jt} + LQ_{ijt} \delta_t T_t + \gamma_j C_j + \epsilon_{ijt} \quad (1)$$

Where  $I_{ijt}$  is the ex-post spread for bank  $i$  in country  $j$  at time  $t$ .  $RS_{ijt}$  is the regulated rate on savings deposits of bank  $i$  in country  $j$  at time  $t$ ,  $RR_{ijt}$  is the required reserve of bank  $i$  in country  $j$  at time  $t$ ,  $OC_{ijt}$  is the operating cost of bank  $i$  in country  $j$  at time  $t$ ,  $PL_{ijt}$  is the provision for loan losses of bank  $i$  in country  $j$  at time  $t$ ,  $MP_{jt}$  is the market structure of the commercial banking sector in country  $j$  at time  $t$ ,  $GDP_{jt}$  is the growth rate of real gross domestic product of country  $j$  at time  $t$  and  $LQ_{ijt}$  is the ratio of liquid assets to total assets of bank  $i$  in country  $j$  at time  $t$ .  $T_t$  and  $C_j$  are time and country dummy variables and  $\epsilon_{ijt}$  is the white noise error term.

The empirical estimation of equation 1 is carried out in two ways. First, using aggregate banking system data, fixed effects pool regression is used to provide common coefficient estimates of all the explanatory variables for ECCU as a whole. Second, fixed effects pooled regressions with the operating costs, provision for losses and the gross domestic product variables being<sup>3</sup> cross section specific coefficients are employed to generate estimates of the level of these variables for the foreign and indigenous banks separately. All regressions are estimated using the seemingly unrelated method (SUR) as the weighting option. This method corrects for both cross section heteroscedasticity and contemporaneous correlations. Further, all estimations are done using iterative two-stage least squares to account for any endogeneity among the variables. The econometric estimation has been carried out using EVIEWS 5.0.

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<sup>3</sup> The regulatory, liquidity and market power variables are not used as cross section specific variables since they exhibit minimal variation across countries. The regulatory variables are both administered by the common monetary authority and the HHI is virtually similar in all countries.

## 6.0 EMPIRICAL RESULTS

The results from the panel regression analysis on the factors that influence bank spreads in the ECCU are reported in tables 5 to 7.

### *i) Common Coefficient Estimates – Total Banking System*

The results in table 5 show that the market power variable is positive and is the most significant variable at the one percent level. The coefficient indicates that the aggregate banking sector in the ECCU did have some degree of market power in setting interest rates which tended to raise interest rates spreads by 10.46 percentage points on average over the study period *ceteris paribus*.

The empirical estimates show that there is a positive and significant relationship between the regulated savings deposit rate and interest rate spreads. The coefficient of 0.48 implies that over the study period, the statutory minimum deposit rate has raised interest rates spreads in the ECCU by 0.48 percentage point on average over the study period. Randall (1998) hypothesised that the minimum savings deposit rate may have triggered a proliferation of deposits and as a consequence, exerted upward pressure on bank spreads by raising marginal interest costs and possibly banks operating costs.

The positive and statistically significant coefficient of 0.01 on the GDP variable suggests that as national income expanded in the ECCU countries the demand for loans also increased. This resulted in banks charging higher lending rates and thus raising the region's average interest rate spread by 0.01 percentage points.

The estimation results show that the coefficient on the reserve requirement variable is significant at the one percent level but is incorrectly signed. On the surface this result seems highly counterintuitive. However, it could be that banks are counting liquidity as part of their reserves. Given that excess liquidity exists in the banking system, banks exposure to liquidity risks is low and this may contribute to narrower spreads. The negative and significant coefficient on the liquidity risk variable strengthens this point.



Both the operating cost and provision for loan loss variables are positive and significant at the one percent level confirming the well known assertion that banks operating with high costs due to diseconomies of scale and /or costs associated with bad debt write offs, must operate with high spreads to cover those costs.

*ii) Cross Section Specific Estimates – Foreign Banks*

Table 6 presents the results when the operating cost, provision for loan losses and the GDP variables are estimated as cross section specific variables using the data of the foreign banks. Of the three cross section specific variables, the operating cost variable is significant and positive in six of the ECCU countries implying that increasing operating costs of the foreign banks contribute to higher spreads in those countries. It could be the case that head office overheads are being spread over too few branches. In Montserrat and Saint Lucia the coefficients on the operating cost variable are negative but not significant. The coefficient on the provision for loan loss variable is significant and positive only in Montserrat, the result may be indicative of the high levels of loan defaults, which resulted following the natural disasters that occurred during the study period. The escalation of loan defaults would have resulted in banks pushing up their lending rates to cover the cost of bad debt write offs which would have resulted in higher spreads. Anguilla and Saint Lucia had negative and significant coefficients suggesting that banks in those countries may be under provisioning. The coefficient on the GDP variable is significant and positive in Antigua and Barbuda and Montserrat and significant and negative in Dominica, Grenada, Saint Lucia and St Vincent and the Grenadines.

Of the common coefficient variables, one salient result is the negative and strongly significant coefficient on the market power variable. This result is not surprising. The rationale is that the more competitive the banking system, the harder it is for banks to coordinate higher prices and this contributes to lower spreads. The HHI shows a low level of market power among the foreign branch banks; in other words there is not a significant departure from a perfectly competitive system. The parameter values of the other three common coefficient variables are

similar to those obtained in the common coefficient results shown in table 5 except now the reserve requirement has its a priori sign, however, the variable is insignificant.

*iii) Cross Section Specific Estimates – Indigenous Banks*

Table 7 reports the estimation results when operating cost, provision for loan losses and the GDP variables are estimated as cross section specific variables for the indigenous banks. The results of the operating cost variable are dissimilar to those of the foreign banks with the coefficient on the variable being significant and positive in only three countries. In Antigua and Barbuda, Anguilla and Grenada the coefficient on the variable is negative and significant. The provision for the loan loss variable is significant and positive only in Anguilla. In all the other countries with the exception of Dominica and Saint Lucia the coefficient of the variable is negative and significant suggesting that indigenous banks in those countries may be under provisioning. The coefficient on the GDP variable is significant and positive in seven of the ECCU countries.

Of the common coefficients, the market power variable is positive and is the most significant coefficient. The coefficient of 9.27 implies that the high level of concentration (i.e limited competition) among the indigenous banks has raised their average interest rate spreads by 9.3 percentage points over the study period. As shown by the value of the HHI, the market structure of the indigenous banks in the respective countries can be described as heavily concentrated. The regulated savings deposit rate is also significant and positive, while the reserve requirement is significant and negative. The liquidity risk variable does not have the correct sign however, the variable is not significant.

## **7.0 DISCUSSION OF RESULTS**

The findings of this study forms a basis for framing the correct policy to achieve convergence of individual country bank spreads to their efficient levels. The empirical estimates show that the regulated savings deposit rate is one of the main determinants of interest rate spreads in the ECCU, with the coefficient on this variable being positive and significant in all regressions. The regulation of the interest rate on savings deposits raises the cost of capital to firms. The

loan rate exceeds the deposit rate by a factor that is partly explained by the binding floor on the savings deposit rate. In the situation where the higher deposit rate serves primarily as a mechanism to pay depositors higher incomes rather than lead them to save more, then the regulated savings deposit rate serves to transfer incomes from investing firms to consuming households. Randall (1998), in her study of the ECCU countries also found that bank spreads were positively impacted by the Central Bank's administered regulated savings deposit rate. Greenidge and McClean (1997) also found a similar result for Barbados.

Liberalising the floor on savings will eliminate the price distortion that currently exists. There are, however, some important considerations to be taken into account when addressing the issue of liberalising the floor on savings deposits. These have to do with the level of the high level of liquidity in the banking system and the relatively unsound macroeconomic conditions in some of the ECCU countries. These are beyond the scope of this study. However, the empirical result that the floor on savings contributes to wider spreads maybe used as one argument to support a policy of market driven rates. This study can therefore be used as a springboard to motivate further research on the economic costs and benefits of market-determined rates.

In relation to the reserve requirement, the empirical results suggest that there is an inverse relationship between this variable and commercial banks' spreads. On the surface, this result seems counterintuitive. However, Demiirguc-kunt et al (1999) in their study of eighty countries also found that bank reserves affected spreads negatively. The bank reserve coefficient in the interest rate spread equation, in their view, showed two effects; first, less than market-remuneration and second, the impact of banks' lending and deposit rates. They contend that the negative coefficient suggests that that the second effect was non-existent or too minimal to offset the first effect. In the context of the ECCU, the negative coefficient may be signalling that banks are counting their liquidity as part of their reserves. Given the excess liquidity in the banking system, the liquidity risks are low and this could be contributing to narrower spreads. The negative relationship between the liquidity risk variable and bank spread strengthens this point.

Regarding the bank specific variables, a positive relationship was found between bank spreads and operating costs for both the foreign and indigenous banks. This relationship was most pronounced in St Kitts and Nevis. This result speaks to the size and diseconomies of scale in the operations of commercial banks. Enhancing operational efficiencies to exploit scale and scope economies must become an urgent priority of banks. Most studies tend to support a positive and significant relationship between bank spreads and operating costs. Randall (1998) for the ECCU countries, Moore and Craigwell (2000) for some CARICOM countries and Barajas et al (1999) for Colombia.

Commercial banks can increase their operational efficiency and realize cost saving through technological change. ATM machines were a good initiative in this regard. Banks should move towards electronic banking systems, high-speed check readers and check imaging systems. These can allow banks to reduce costs by substituting physical capital for labour. Commercial banks can also achieve cost savings by offering a broader array of deposit and investment products such as money market accounts, mutual funds and securities underwriting. By producing a more heterogeneous output mix, banks might be able to capture scope economies. Further, the issue of amalgamation/consolidation especially among indigenous banks should also be seriously considered as another means of enhancing operational efficiency.

On aggregate, provision for loan losses was also found to have contributed to the widening of bank spreads in the ECCU over the study period. This finding squares with other findings for the Caribbean, Moore and Craigwell (2000) and for Latin America, Barajas et al (1999). However, on a disaggregated level, especially among indigenous banks an inverse relation between spreads and this variable was found. This result may be suggesting two things. Firstly, that commercial banks' risk provisioning is not adequately aligned with actual levels of loan losses. Secondly, commercial banks may be under provisioning.

As it relates to economic activity, for the most part the empirical results show a positive relationship between this variable and bank spreads. This result is surprising given that over the study period the ECCU economies have been exposed to negative economic shocks such as hurricanes, which would have had an adverse impact on the banking sector in terms of an

escalation of loan defaults. Although surprising, the result is not atypical, Moore and Craigwell (2000) found a similar result for some CARICOM countries. According to the authors as income expands the demand for loans increases and this in turn may push up lending rates and consequently banks spreads.

The market power variable has provided some interesting results. The empirical estimates indicate that the ECCU's banking sector as a whole did have some degree of market power in setting interest rates. This finding is similar to other results especially for small banking sectors in developing countries. Moore and Craigwell (2000) found a similar result for some CARICOM countries, while Chirwa et al (2004) found this result for the Malawian banking system. However, when foreign and indigenous banks were disaggregated it was found that amongst the foreign banks the level of concentration in the market was quite low. The low level of concentration (i.e high degree of competition) among the foreign banks resulted in the narrowing of their spreads over the period. This is in contrast to the indigenous banks where there exists a heavily concentrated market that resulted in a widening of their spreads over the period. Barajas et al (1999) also found that competitive behaviour among private banks in Colombia also contributed to lower spreads. In respect of competition, the authorities ought to develop a market for commercial papers and further strengthen the equity market to improve the competitive environment in the financial system. A more competitive environment would mitigate the monopoly rents extracted by banks. In addition, the continued development of viable alternatives to commercial banks' output must be encouraged. These include credit unions, trust companies and other non-bank financial institutions. In addition, new entrants to the banking system should be easily facilitated. New choices would raise deposits rates and may lower lending rates, which will permit spreads to narrow over time.

## **8.0 CONCLUSION/RECOMMENDATIONS**

The paper used pooled annual commercial banks data, over the period 1993 to 2003 to investigate some of the main factors influencing interest rate spreads in the ECCU. The determinants of interest rate spreads were classified as follows; regulatory variables; those relate to the regulated rate on savings deposits and the reserve requirement; bank specific

variables which include operating costs and the provision for loan losses, a market power variable to gauge the level of inter-bank competition and the rate of growth of GDP as a proxy for economic activity. The analysis was done not only for the aggregate banking system but also for the foreign and indigenous banks separately.

This study evinces two main insights. First, Foreign owned banks have operated with persistently larger spreads than their indigenous counterparts. Second, the econometric analysis supports evidence that the observed commercial bank's spreads in the ECCU were positively and significantly impacted by the Central Bank's regulated savings deposit rate, the high level of market concentration in the banking system, high operating costs and non-performing loans of the commercial banks.

Several policy implications emanate from the study. Firstly, the high responsiveness of commercial banks' spreads to the proxy for the regulated minimum savings deposit rate suggests that deregulating the floor on savings must eventually take place. This will eliminate the current distortion and permit spreads to narrow. Secondly, commercial banks must continue to seriously deal with the issues of the high levels of non-performing loans and the diseconomies of scale in their operations. Thirdly, if there is to be any success in reducing commercial banks' interest rate spreads to support long-term economic growth, the competitive environment in the banking system must be enhanced.

This study can be extended by exploring the impact of financial sector development on interest rate spreads in the commercial banking system. With the establishment of the Regional Governments Securities Market, the Eastern Caribbean Securities Exchange and the more potent roles being played by credit unions and insurance companies in recent times, it would be interesting to examine how those developments have influenced banks' spreads in the region.

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## APPENDICES

**Table 5: Common Coefficients Estimation Results – Total Banking System**

<i>Variable</i>	<i>Ex- Post Spread</i>
Regulated savings deposit rate	0.48, (4.12)*
Reserve Requirement	-5.11, (-39.64)*
Provision for Loan Losses	0.06, (39.44)*
Operating Costs	0.08, (8.36)*
Market Power	10.46, (17.40) *
Liquidity Risk	-0.10, (-130.47)
Gross Domestic Product	0.01, (45.40) *
Adjusted R <sup>2</sup>	0.99
Durbin-Watson Statistic	2.30
Number of Observations	72

Notes: Estimations are done using two-stage - least - squares to account for any endogeneity of variables. t-statistics are shown in parenthesis. One asterisk denotes significance at the one per cent level, two asterisks denote significance at the 5 percent level and three asterisks denote significance at the 10 per cent level.

**Table 6: Cross Section Specific Estimation Results – Foreign Banks**

<i>Variables</i>	<i>Ex-Post Spread</i>		
Regulated Savings Deposit Rate	2.89, (3.01) **		
Reserve Requirements	0.04, (1.62)		
Market Power	-50.34, (-6.16)*		
Liquidity Risk	-0.02, (-1.99) ***		
	<b>Operating Costs:</b>	<b>Provision for Loan Losses:</b>	<b>Gross domestic Product</b>
Antigua & Barbuda	6.71, (9.97) *	-0.27, (-0.73)	6.15, (1.86) ***
Anguilla	0.81, (2.15) **	-0.72, (-3.74) **	-5.45, (-1.63)
Dominica	3.27, (2.88)**	-0.02, (-0.15)	-11.57, (-2.81) **
Grenada	7.54, (9.04) *	-1.15, (-1.30)	-4.24, (-1.73)***
Montserrat	-0.40, (-1.35)	0.06, (2.58) **	21.81, (11.61) *
St Kitts & Nevis	6.03, (2.83) **	0.65, (0.40)	-1.65, (-0.48)
Saint Lucia	0.88, (0.36)	-0.86, (-3.64) **	-18.01, (-4.79) *
St Vincent & Grenadines	6.24, (1.92)***	0.27, (0.42)	-10.15, (-2.97) **
Adjusted R <sup>2</sup>	0.99		
Durbin-Watson Statistic	2.69		
Number of Observations	72		

Notes: Estimations are done using two –stage - least - squares to account for any endogeneity of variables. t-statistics are shown in parenthesis. One asterisk denotes significance at the one per cent level, two asterisks denote significance at the 5 percent level and three asterisks denote significance at the 10 per cent level.

**Table 7: Cross Section Specific Estimation Results – Indigenous Banks**

<i>Variables</i>	<i>Ex-Post Spread</i>		
Regulated Savings Deposit Rate	1.77, (2.10)**		
Reserve Requirements	-0.01, (-15.97) *		
Market Power	9.27, (13.03) *		
Liquidity Risk	1.54, (1.68)		
	<b>Operating Costs:</b>	<b>Provision for Loan Losses:</b>	<b>Gross domestic Product</b>
Antigua & Barbuda	-3.75, (-6.45) *	-3.04, (-3.42) **	19.69, (7.48)*
Anguilla	-1.31, (-2.85) **	15.17,(3.14) **	29.50, (7.78) *
Dominica	0.30, (0.63)	-0.05, (-0.02)	-11.58, (-1.35)
Grenada	-1.53, (-2.22)**	-10.64, (-4.04) **	30.27, (4.83)*
Montserrat	0.61, (3.42) **	-0.48, (-1.72) ***	32.80, (14.19) *
St Kitts & Nevis	12.85, (7.81) *	-3.56, (-7.25)*	34.09, (9.07)*
Saint Lucia	0.46, 0.84)	-1.03, (-1.36)	18.03, (4.04)**
St Vincent & Grenadines	1.05, (3.42)**	-0.49, (-2.48) **	7.62, (2.08)**
Adjusted R <sup>2</sup>	0.99		
Durbin-Watson Statistic	2.31		
Number of Observations	72		

Notes: Estimations are done using two –stage - least - squares to account for any endogeneity of variables. t- statistics are shown in parenthesis. One asterisk denotes significance at the one per cent level, two asterisks denote significance at the 5 percent level and three asterisks denote significance at the 10 per cent level.