



NON-INTEREST INCOME AT COMMERCIAL BANKS IN BARBADOS: AN EMPIRICAL NOTE

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Abstract

This study discusses the trend and determinants of non-interest income in the Barbadian banking industry during the period 1985 to 2001. The results suggest that the incidence of non-interest income declined over the period, contrary to the findings in other countries of the Caribbean and the wider developed world. A review of the literature and a panel data regression model confirm that this result may be attributed to the absence of some of the factors that were pinnacle to the generation of non-interest income in developed countries, such as deregulation and technological change, especially for the development of loan securitisation and credit scoring. The empirics support bank characteristics and market developments like the ATM technology as the most influential factors shaping the trend of non-interest income in the banking industry in Barbados.

Key words: Non-interest income, panel data

JEL: C23, N2

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1. Introduction

This note has two purposes: (i) to provide some stylised facts about trends in commercial banks' non-interest income in Barbados over the period 1985-2001, and (ii) to identify the factors that shaped these trends using casual observation of the literature and panel data econometrics. It is motivated by the recent comments of banking analysts and other commentators that, given the current low interest rate environment, the high profitability prevailing in the Barbadian banking system maybe attributed to the growth in non-interest income, mainly occasioned by the entry of new technologies and opportunities available to banks (PricewaterhouseCoopers, 2004). In addition, there is a school of thought (see, for example, references in DeYoung and Rice (2003)) that non-interest income generating activities should be encouraged since they could reduce risks through increased diversification and are more stable because they are absolved from credit or interest rate risks.

2. Trends in Non-Interest Income in Barbados

There was an overall increase in the level of non-interest income in the Barbadian commercial banking industry during the sample period 1985 to 2001. In 1985 aggregate non-interest income of commercial banks was approximately \$33.1 million, and by 2001 this total had grown to about \$117.9 million. Figure 1 shows that, in general, the rise in non-interest income was more pronounced after 1993. Additionally, large banks experienced a stronger overall growth than smaller banks, while the latter registered the bigger average annual rate of increase.

However, despite the rise in aggregate levels of non-interest income in Barbados, various measures of the incidence of non-interest income (Table 1a) suggest that its relative importance in the commercial banking industry has actually diminished. Specifically, industry non-interest income-to-assets fell by 0.27 of a percentage point during the period to 2.18% in 2001. The data reveals that for large banks, non-interest income as a percentage of total assets was relatively stable throughout the period but at the end of 2001, decreased by 0.20 of a percentage point to 2.16%. At small banks, however, the comparable ratio of non-interest income-to-total assets exhibited considerable fluctuation, shrinking from 3.51% in 1985 to 2.35% in 2001. Industry

non-interest income as a percentage of operating income also fell between 1985 and 2001, by 5.9 percentage points to 33.47%. For large banks, non-interest income-to-operating income dropped from 37.7% to 33.1%, while smaller banks experienced a more substantial contraction from 60.1% to 36.3%.

With regard to the composition of non-interest income in the commercial banking industry, Table 1b clearly shows that fee income represents the most significant component of non-interest income in Barbados, even though the overall industry ratio of fee income to non-interest income decreased from 88.5% in 1985 to 83.3% by 2001, while the portion of non-interest income arising from other non-fee sources grew to 16.7%, up from 11.5% in 1985. At small banks, fee income was the sole source of non-interest income between 1985 and 1994, but its contribution gradually decreased thereafter to 58.4% in 2001, as other non-fee sources expanded to 41.6% of total non-interest income. The ratio of fee income to non-interest income at large banks fell only marginally over the period to 86.3%, with other non-fee income providing about 13.7% of total non-interest income. Further division of fee income across the industry reveals that small banks saw a rise in the proportion of non-interest income attributed to service charges on deposit accounts, but registered sharp declines in the contribution of foreign exchange charges and other fee income. Additionally, although less pronounced, large banks recorded movements similar to those of small banks in the share of non-interest income provided by foreign exchange and service charges. However, in contrast to small banks there was a noticeable increase in the percentage of non - interest income derived from the other fees category at large banks.

3. A Comparison With Other Banking Systems

Table 2 shows a comparison of banks' non-interest income as a percentage of total assets for various countries in 2001. Barbados ranked in the upper range, 6th out of 19 countries. However, it is below the Caribbean islands of Trinidad and Tobago and Jamaica who topped the standings, even above the developed industrial countries in Europe and North America. Hence, Caribbean countries appear to be generating more non-interest income per dollar of assets than other major countries in the world.

Table 3, which focuses on the Caribbean countries, reveals that, unlike Trinidad and Tobago and Jamaica, non-interest income now constitutes a smaller proportion of banks' financial flows in Barbados. In addition, Hawtrey (2003), among others, reports an increasing trend for non-interest income in the developed countries, reflecting rising revenue from wealth management and financial market operations rather than retail banking fees. Table 4 shows that fee income is undoubtedly the main source of non-interest income for both Barbados and Trinidad and Tobago; however, investment income is by far the largest contributor to non-interest income in Jamaica. It is also apparent from Table 4 that while reliance on fee income declined somewhat in Barbados and Jamaica during the period 1985 to 2001, it expanded in Trinidad and Tobago due largely to a notable increase in fees associated with loans. In the United States, according to Stiroh (2004), the biggest expansion in non-interest income between 1980 and 2000 was in fees and other income, although the other categories (fiduciary income, service charges and trading revenue) showed sizeable growth as well.

4. Why Has the Incidence of Non-Interest Income at Banks in Barbados Not Increased?

The best way to answer this question is to review the factors that have increased non-interest income in the rest of the world and compare them with the situation in Barbados. Hawtrey (2003) provides an interesting discussion of these issues. He sets out five main factors that may have influenced the growth of non-interest income in the international arena: (i) deregulation; (ii) expanding consumer needs; (iii) technology; (iv) supervision, and; (v) globalization.

Deregulation of the financial sector in the United States and other developed countries and its consequential increased competition has not really filtered down into the Barbadian banking system and therefore the steady narrowing of net-interest margins has not occurred in Barbados (see Craigwell and Moore (2002)). With respect to expanding consumer needs, there appears to be no significant new types of bank activity in Barbados. For instance, there still seems to be the heavy reliance on past book accounts rather than superannuation which is peculiar to funds management. Technology change can impact non-interest income in three different ways; namely, through loans securitization and credit scoring, disintermediation and new delivery

channels. In Barbados, there is little evidence of loans securitization and credit scoring. Additionally, although other financial institutions have been growing, banks are still the dominant force in the financial sector in Barbados (see Belgrave, Craigwell and Moore (2004)). Hence, disintermediation does not appear to be a major factor affecting non-interest income in Barbados. New delivery channels like automated telling machines (ATMs), have provided more choice and convenience for customers for additional fees (see Parris (2002) and Coppin, Craigwell and Moore (2003)). With regard to bank supervision, Basel I and II have not really been finalised in Barbados and it is doubtful that banks have looked at pricing the assets on their books differently as a result of these regulatory requirements. Finally, globalisation has created some mergers and acquisitions and this might have encouraged Barbadian banks to fall in line with world pricing benchmarks and international practices, affecting fee income in the process. In summary it seems that most of the major factors that cause banks in the developed world to generate more non-interest income have not been fully realised in Barbados.

5. An Empirical Model of Non-interest Income

The model used here is based on DeYoung and Rice (2003) where non-interest income as a percentage of assets (NIIRATIO) is written as a function of bank efficiency, technology change, bank strategy, bank size and organisation as well as the bank external environment. Formally

$$\text{NIIRATIO} = f(\text{Bank efficiency, Technological change, Bank strategy, Bank size and organisation, Bank external environment})$$

The task now is to find appropriate indicators for these determinants. This is difficult because of the unavailability of some of the data and because the chosen proxy may have more than one interpretation. With these caveats in mind the indicators of the determinants will now be given. Bank efficiency is measured by each bank's relative financial performance, calculated as the bank return on assets minus the average return on assets of the other banks. The sign on the coefficient of this variable is likely to be ambiguous since it is not clear that well managed banks will generate lower or higher amounts of non-interest income per dollar of assets. However, the evidence from North America suggests that this sign should be negative as non-interest income is

fairly volatile and the return from non-interest income is not large enough to justify the added risk (see DeYoung and Rice (2003)).

Technology change is captured by a dummy variable reflecting the introduction of ATMs. The number of ATMs per capita and the number of cashless transactions per capita would have been preferable but they were not available. As DeYoung and Rice (2003) argue, this type of technology advance and adoption is expected to increase non-interest income at banks by generating new fee income that more than outweighs the losses of fee income related to the reductions in cash balance depositors need to hold in checking and other liquid bank accounts.

Several indicators were tried to capture the strategic responses of banks. From the lending side, the loan-to-asset ratio, the composition of the loan portfolio (real estate, consumer and commercial and industrial loan share), and the riskiness of the loan portfolio (allowance for loan-losses-to-assets ratio, loan concentration Herfindahl index) were all included. High levels of loan-to-assets are indicative of an intermediation-based lending strategy in which banks rely on interest income. Therefore, the sign on this variable should be negative. The a priori impact on the loan portfolio will depend on the peculiar features of the respective loan categories in generating fee income. In Barbados, for example, real estate lending may provide more opportunities for fee income at banks than other types of loans since for the majority of customers banks are the first and primary choice for the acquisition of land and home ownership. In this case, the sign on the parameter of the real estate variable is expected to be positive while that on other loans, where there may be several lending alternatives, is likely to be negative. With respect to the riskiness of the loan portfolio, standard finance theory argues that the more risky the banking sector portfolio the greater non-interest income should be to compensate banks' shareholders for risk.

Apart from the lending side of the banks' strategy, this study also incorporates a core deposits-to-assets ratio to capture the traditional relationship banking, a dummy variable for credit card banks to reflect the effects of the non-traditional banking strategy and the ratio of full-time employees to deposits to represent personalized services. Banks with large amounts of core deposits funding tend to generate high levels of non-interest income per dollar of assets,

suggesting that close relationships with depositors provide ready customers additional fee-based services and/or allow banks to take advantage of inelastic demand (due to switching costs) and increase the prices of these services. Non-interest income should be positively related to credit card banking. The sign of the coefficient on the personalized service variable is expected to be positive, implying that customers are willing to pay higher fees to banks that offered increased levels of personal service. DeYoung and Rice (2003) noted that this variable could also represent inefficient spending on labour.

The logarithm of assets and a dummy variable reflecting the difference between foreign and local banks, respectively, captures bank size and organisation. Although the literature generally suggests that it is large foreign banks that tend to generate more non-interest income, there is no a priori reason why small local banks cannot use non-interest income to boost their revenue streams.

The bank's environment is measured in this paper by economy wide job growth. This sign on this variable is expected to be positive since greater job growth should be associated with increased income and banking activity.

The definitions of all of these variables along with the descriptive statistics are given in the Appendix.

6. Methodology and Results

Eviews 5 is the econometric software programme utilised for all the computations. The model is estimated for 7 banks using pooled least squares (heteroscedasticity adjusted) on an unbalanced panel with fixed effects over the quarterly period 1985-2001. The model seems to fit the data pretty well with an R square of nearly 92 per cent. Almost all of the coefficients are significant and have economic reasonable signs (see the regression results in Table 5a, b).

It appears that the relative performance of banks is not significant in explaining non-interest income in Barbados. This is contrary to the findings in the United States where banks' relative performance was shown to be a significant and negatively related variable.

The technology variable behaved as anticipated indicating that technology is vital to the generation of non-interest income in Barbados. Hence, banks with more advanced technology tends to generate higher levels of non-interest income per dollar of assets.

The loan-to-assets indicator carries the a priori sign, that is, high levels of loans-to-assets give low levels of non-interest income. Banks that focus on consumer lending create more opportunities to sell fee-based services. Likewise, banks that expend resources on real estate lending, as well as commercial and industrial lending, tend to earn more non-interest income. These results are against the evidence found in the United States where it is argued that consumers tend to shop for mortgages and other loans beyond the commercial banks. With respect to the riskiness of the loan portfolio, the insignificance of the parameter on the Herfindahl index suggests that risk is not a major determinant in generating non-interest income in Barbados. Allowance for loan-losses-to-assets ratio was also included as a measure of loan quality but was omitted because it resulted in a singular matrix and consequently least squares estimates could not be obtained.

The variable representing the traditional relationship of banking is not significant, suggesting that banks have not been able to take advantage of the close relationships with depositors to encourage them to undertake additional fee-based services and/or pay more for these services given customers' inelastic demand (due to switching costs). The credit card variable has the expected positive sign, while the coefficient on the personalized service variable implies that customers are willing to pay fees to banks that offer higher levels of personalized services.

The bank size and organization indicators are significant but the sign is contrary to the empirical evidence found in the United States. That is, the level of bank size is associated with lower non-interest income and foreign banks generate less non-interest income per dollar of assets than local banks. This could be an indication that small local banks provide more personalized

service to customers than their large foreign counterparts; hence they benefit from the positive relationship between personalized service and non-interest income.

Finally the bank environment indicator, measured by growth in employment, is insignificant, suggesting that non-interest income is not affected by the external environment of the banks.

Conclusions

This paper discusses the trend and determinants of non-interest income in the Barbadian banking system. It finds that the incidence of non-interest income declined over the period 1985 to 2001, contrary to other countries in the Caribbean and the wider developed world. Apparently, most of the major factors that cause banks in the developed world to generate more non-interest income, like deregulation and technological change for the development of loan securitization and credit scoring, have not yet taken root in Barbados. Bank characteristics as well as market developments like the ATM technology seem to be the most influential factors shaping the pattern of non-interest income in the banking industry in Barbados, results confirmed by an empirical model using panel data. Further research could be done to ascertain whether non-interest income reduces risks via diversification.

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Table 1a: Non-interest Income (Percentage of Assets and Operating Income) in Barbados

	Aggregate Banks		Small Banks		Large Banks	
	Non-interest Income		Non-interest Income		Non-interest Income	
	% of Total Assets	% of Operating Income	% of Total Assets	% of Operating Income	% of Total Assets	% of Operating Income
1985	2.45%	39.4%	3.51%	60.1%	2.35%	37.7%
1986	2.24%	35.6%	1.87%	37.7%	2.29%	35.4%
1987	2.12%	34.4%	1.81%	32.8%	2.16%	34.5%
1988	2.13%	34.3%	1.51%	30.7%	2.22%	34.7%
1989	2.36%	33.4%	1.69%	28.8%	2.46%	33.9%
1990	2.35%	36.3%	1.94%	33.1%	2.41%	36.7%
1991	2.36%	33.7%	2.18%	35.6%	2.38%	33.5%
1992	2.20%	31.5%	2.45%	33.0%	2.17%	31.3%
1993	2.26%	35.8%	1.12%	29.8%	2.41%	36.2%
1994	2.35%	35.1%	1.23%	25.4%	2.49%	36.0%
1995	2.32%	34.2%	2.52%	31.1%	2.30%	34.7%
1996	2.21%	36.6%	1.88%	34.2%	2.25%	36.9%
1997	2.32%	37.8%	1.82%	30.1%	2.37%	38.6%
1998	2.31%	32.4%	2.39%	32.0%	2.30%	32.4%
1999	2.25%	32.8%	2.39%	33.5%	2.24%	32.8%
2000	2.34%	34.3%	2.88%	38.8%	2.28%	33.8%
2001	2.18%	33.5%	2.35%	36.3%	2.16%	33.2%

Source: Central Bank of Barbados

Notes: Commercial banks are classified as small if their average assets over the last 10 years (1992 – 2001) is less than \$500,000; banks whose 10 year average assets exceeds \$500,000 are classified as large.

Table 1b: Composition of Non-interest Income in Barbados

	Aggregate Banks					Small Banks					Large Banks				
	Composition of Non-interest Income					Composition of Non-interest Income					Composition of Non-interest Income				
	Fee Income				Other Non-interest Income	Fee Income				Other Non-interest Income	Fee Income				Other Non-interest Income
	Foreign Ex. Charges	Service Charges	Other Fees	Total Fee Income		Foreign Ex. Charges	Service Charges	Other Fees	Total Fee Income		Foreign Ex. Charges	Service Charges	Other Fees	Total Fee Income	
1985	58.7%	8.5%	21.3%	88.5%	11.5%	51.2%	2.3%	46.5%	100.0%	0.0%	59.6%	9.4%	18.0%	87.0%	13.0%
1986	60.0%	9.1%	20.6%	89.6%	10.4%	50.3%	3.3%	46.5%	100.0%	0.0%	61.1%	9.8%	17.6%	88.4%	11.6%
1987	64.0%	11.6%	13.9%	89.5%	10.5%	57.4%	5.2%	37.4%	100.0%	0.0%	64.7%	12.3%	11.2%	88.3%	11.7%
1988	62.4%	8.4%	19.7%	90.5%	9.5%	58.4%	5.2%	36.3%	100.0%	0.0%	62.9%	8.8%	17.9%	89.6%	10.4%
1989	63.4%	9.3%	18.0%	90.7%	9.3%	61.6%	6.5%	31.8%	100.0%	0.0%	63.6%	9.6%	16.5%	89.7%	10.3%
1990	64.6%	9.4%	15.8%	89.8%	10.2%	61.0%	6.0%	33.0%	100.0%	0.0%	65.1%	9.8%	13.9%	88.7%	11.3%
1991	57.9%	11.0%	19.9%	88.8%	11.2%	56.7%	7.2%	36.1%	100.0%	0.0%	58.1%	11.5%	17.8%	87.4%	12.6%
1992	50.8%	12.0%	26.5%	89.2%	10.8%	62.9%	8.1%	29.0%	100.0%	0.0%	49.3%	12.4%	26.2%	87.9%	12.1%
1993	51.2%	12.5%	30.4%	94.1%	5.9%	47.5%	13.0%	39.5%	100.0%	0.0%	51.4%	12.5%	29.9%	93.8%	6.2%
1994	53.2%	9.9%	27.2%	90.3%	9.7%	50.9%	17.1%	32.0%	100.0%	0.0%	53.4%	9.4%	26.9%	89.6%	10.4%
1995	53.3%	9.8%	21.7%	84.8%	15.2%	48.0%	12.4%	26.6%	87.0%	13.0%	54.0%	9.5%	21.1%	84.6%	15.4%
1996	48.7%	10.7%	23.0%	82.4%	17.6%	31.0%	11.9%	11.0%	53.9%	46.1%	50.3%	10.6%	24.0%	84.9%	15.1%
1997	47.2%	9.5%	25.9%	82.7%	17.3%	30.9%	12.5%	19.8%	63.1%	36.9%	48.6%	9.3%	26.5%	84.3%	15.7%
1998	49.1%	8.5%	25.9%	83.5%	16.5%	27.9%	10.3%	18.0%	56.2%	43.8%	51.3%	8.3%	26.7%	86.4%	13.6%
1999	47.3%	9.3%	21.9%	78.5%	21.5%	21.4%	9.7%	22.4%	53.5%	46.5%	50.1%	9.3%	21.8%	81.2%	18.8%
2000	46.1%	11.8%	25.7%	83.6%	16.4%	16.2%	9.1%	30.3%	55.6%	44.4%	50.0%	12.1%	25.1%	87.3%	12.7%
2001	44.0%	11.8%	27.5%	83.3%	16.7%	16.0%	12.0%	30.5%	58.4%	41.6%	47.4%	11.8%	27.2%	86.3%	13.7%

Source: Central Bank of Barbados

Notes: Commercial banks are classified as small if their average assets over the last 10 years (1992 – 2001) is less than \$500,000; banks whose 10 year average assets exceeds \$500,000 are classified as large.

Table 2: A Comparison of Banks' Non-interest Income as a Percentage of Total Assets for various Countries in 2001

Country	Non-interest Income (%)
Australia	1.5
Belgium	0.9
Canada	2.2
Denmark	1.3
Finland	3.1
France	1.7
Germany	0.7
Italy	1.1
Netherlands	1.2
New Zealand	1.2
Norway	0.8
Spain	0.9
Sweden	1.5
Switzerland	1.7
U.K.	1.4
U.S.	2.6
Average	1.5
Jamaica	10.5
Barbados	2.2
Trinidad & Tobago	3.5

Sources: Central Bank of Barbados, Central Bank of Trinidad and Tobago, Robinson (2002), Hawtrey (2003).

Table 3: Non-Interest Income (Percentage of Assets and Operating Income) in the Caribbean

	Barbados		Trinidad		Jamaica	
	Non-interest Income		Non-interest Income		Non-interest Income	
	% of Total Assets	% of Operating Income	% of Total Assets	% of Operating Income	% of Total Assets	% of Operating Income
1985	2.45%	39.4%	1.54%	22.6%	n.a.	n.a.
1986	2.24%	35.6%	1.46%	21.9%	n.a.	n.a.
1987	2.12%	34.4%	1.37%	22.6%	n.a.	n.a.
1988	2.13%	34.3%	1.45%	24.1%	n.a.	n.a.
1989	2.36%	33.4%	1.45%	23.7%	6.50%	73.9%
1990	2.35%	36.3%	1.32%	23.6%	6.49%	69.1%
1991	2.36%	33.7%	1.67%	28.0%	7.55%	69.9%
1992	2.20%	31.5%	2.09%	29.9%	9.49%	85.4%
1993	2.26%	35.8%	3.07%	42.1%	9.10%	76.6%
1994	2.35%	35.1%	2.43%	39.2%	10.15%	76.3%
1995	2.32%	34.2%	2.20%	38.2%	9.04%	75.2%
1996	2.21%	36.6%	2.42%	42.3%	8.76%	74.2%
1997	2.32%	37.8%	2.28%	37.2%	6.75%	67.3%
1998	2.31%	32.4%	2.08%	33.2%	11.55%	106.5%
1999	2.25%	32.8%	2.64%	36.9%	11.78%	111.9%
2000	2.34%	34.3%	2.53%	35.1%	11.47%	115.1%
2001	2.18%	33.5%	2.77%	39.0%	10.45%	112.7%

Source: Central Bank of Barbados, Central Bank of Trinidad and Tobago, Robinson (2002).

Table 4: Composition of Non-interest Income in the Caribbean

	Barbados				Trinidad				Jamaica						
	Non-interest Income				Non-interest Income				Non-interest Income						
	Fee Income			Other Non-interest Income	Fee Income			Dividend, Rental, & Trust Services Income	Other Non-interest income	Fees, Service Charges, Commissions			Investments	Foreign Exchange Gains	Other Non-interest Income
	Foreign Exchange Charges	Service Charges	Other Fees		Foreign Exchange Profit/(Loss)										
1985	58.7%	8.5%	21.3%	11.5%	40.6%	n.a.	n.a.	59.4%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
1986	60.0%	9.1%	20.6%	10.4%	47.8%	32.2%	7.19%	12.8%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
1987	64.0%	11.6%	13.9%	10.5%	54.5%	29.2%	8.20%	8.0%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
1988	62.4%	8.4%	19.7%	9.5%	41.9%	35.7%	7.92%	14.5%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
1989	63.4%	9.3%	18.0%	9.3%	53.5%	23.9%	6.97%	15.7%	14.3%	61.5%	9.8%	14.4%	n.a.	n.a.	
1990	64.6%	9.4%	15.8%	10.2%	58.7%	25.4%	7.62%	8.2%	13.1%	58.7%	15.5%	12.7%	n.a.	n.a.	
1991	57.9%	11.0%	19.9%	11.2%	53.5%	20.0%	7.58%	18.9%	11.3%	39.7%	37.2%	11.9%	n.a.	n.a.	
1992	50.8%	12.0%	26.5%	10.8%	48.7%	18.2%	9.50%	23.6%	9.4%	61.7%	16.4%	12.4%	n.a.	n.a.	
1993	51.2%	12.5%	30.4%	5.9%	40.5%	41.7%	3.49%	14.4%	10.6%	63.7%	16.6%	9.1%	n.a.	n.a.	
1994	53.2%	9.9%	27.2%	9.7%	46.9%	35.7%	4.82%	12.6%	10.5%	73.0%	10.9%	5.6%	n.a.	n.a.	
1995	53.3%	9.8%	21.7%	15.2%	52.5%	33.3%	4.60%	9.6%	14.7%	68.9%	12.1%	4.2%	n.a.	n.a.	
1996	48.7%	10.7%	23.0%	17.6%	54.0%	26.0%	4.27%	15.7%	13.6%	69.6%	6.0%	10.7%	n.a.	n.a.	
1997	47.2%	9.5%	25.9%	17.3%	56.7%	21.0%	5.21%	17.1%	18.3%	66.0%	7.9%	7.8%	n.a.	n.a.	
1998	49.1%	8.5%	25.9%	16.5%	59.4%	23.2%	7.16%	10.2%	10.5%	83.9%	4.1%	1.5%	n.a.	n.a.	
1999	47.3%	9.3%	21.9%	21.5%	55.2%	24.2%	5.10%	15.5%	9.4%	85.7%	3.2%	1.7%	n.a.	n.a.	
2000	46.1%	11.8%	25.7%	16.4%	56.8%	21.6%	7.84%	14.1%	9.7%	85.1%	4.2%	1.0%	n.a.	n.a.	
2001	44.0%	11.8%	27.5%	16.7%	56.7%	21.9%	8.13%	13.3%	11.4%	82.9%	4.6%	1.1%	n.a.	n.a.	

Source: Central Bank of Barbados, Central Bank of Trinidad and Tobago, Robinson (2002).

Table 5a: Pooled Least Squares Regression Results

Dependent Variable: NIIRATIO1_?
 Sample: 1985Q1 2001Q4
 Included observations: 56
 Cross-sections included: 7
 Total pool (unbalanced) observations: 204
 Linear estimation after one-step weighting matrix

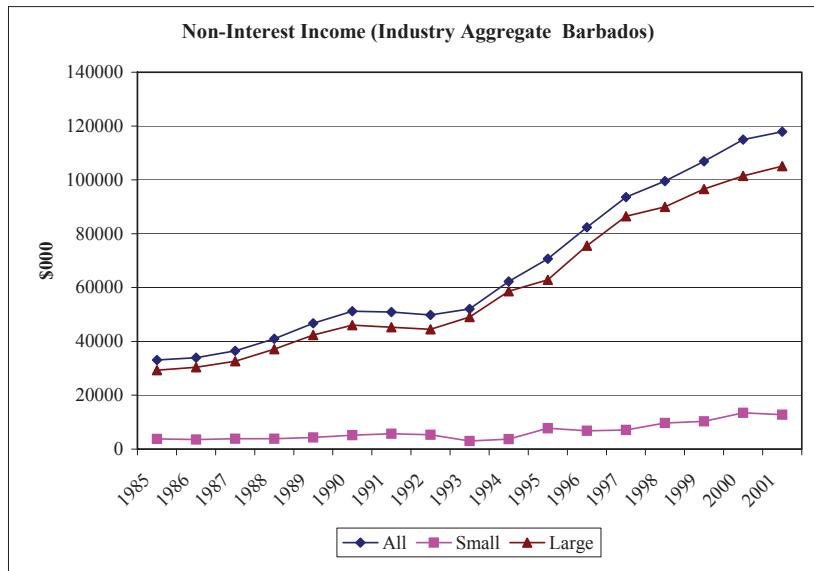
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.016247	0.005591	2.906148	0.0041
RELROA_?	0.013787	0.021351	0.645703	0.5193
FTERATIO_?	0.374464	0.174940	2.140530	0.0336
LNASSETS_?	-0.002202	0.000581	-3.792750	0.0002
FOREIGNBHC_?	-0.001528	0.000916	-1.668802	0.0969
LOANRATIO_?	-0.003748	0.000798	-4.697508	0.0000
RESHARE_?	0.009120	0.001725	5.287024	0.0000
CCBANK_?	0.002579	0.000628	4.103791	0.0001
ATM1_?	0.002863	0.000654	4.378426	0.0000
CISHARE_?	0.007011	0.002193	3.197631	0.0016
LOANCONC_?	2.10E-07	2.55E-07	0.820425	0.4130
CONSHARE_?	0.022563	0.003474	6.495405	0.0000
CORERATIO_?	0.000564	0.001552	0.363417	0.7167
JOBGROWTH_?	0.000876	0.001903	0.460295	0.6458
Fixed Effects (Cross)				
1--C	0.004808			
2--C	-0.003015			
3--C	-0.000214			
4--C	0.001387			
5--C	-0.001902			
6--C	-0.003595			
7--C	0.000732			
Weighted Statistics				
R-squared	0.919131	Mean dependent var		0.006702
Adjusted R-squared	0.910781	S.D. dependent var		0.003150
S.E. of regression	0.000941	Sum squared resid		0.000163
F-statistic	110.0678	Durbin-Watson stat		1.764096
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.791751	Mean dependent var		0.005878
Sum squared resid	0.000173	Durbin-Watson stat		1.500153

Table 5b: Pooled Least Squares Regression Results

Dependent Variable: NIIRATIO1_?
 Sample: 1985Q1 2001Q4
 Included observations: 56
 Cross-sections included: 7
 Total pool (unbalanced) observations: 204
 Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.017930	0.004580	3.914541	0.0001
FTERATIO_?	0.268949	0.159963	1.681316	0.0944
LNASSETS_?	-0.002304	0.000495	-4.650990	0.0000
LOANRATIO_?	-0.003606	0.000590	-6.115791	0.0000
RESHARE_?	0.007753	0.001252	6.193522	0.0000
CCBANK_?	0.002541	0.000590	4.304732	0.0000
ATM1_?	0.002578	0.000597	4.319197	0.0000
CISHARE_?	0.006644	0.001918	3.464725	0.0007
CONSHARE_?	0.022055	0.002891	7.629974	0.0000
Fixed Effects (Cross)				
1--C	0.004271			
2--C	-0.001681			
3--C	-0.000556			
4--C	0.000941			
5--C	-0.002300			
6--C	-0.003105			
7--C	0.000408			
Weighted Statistics				
R-squared	0.921552	Mean dependent var		0.006915
Adjusted R-squared	0.915741	S.D. dependent var		0.003299
S.E. of regression	0.000958	Sum squared resid		0.000173
F-statistic	158.5876	Durbin-Watson stat		1.749601
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.785564	Mean dependent var		0.005878
Sum squared resid	0.000178	Durbin-Watson stat		1.447670

Figure 1



Appendix

Variable Definitions

Variables	Definition
NIIRATIO1	Non-interest income divided by total assets.
RELROA	Bank i's relative performance over the last quarter: return on assets of bank i in period t-1 minus the average return on assets of all banks in period t-1.
LOANRATIO	Total loans divided by total assets.
CISHARE	Commercial and Industrial loans (Manufacturing and Mining, Commerce and Trade, and Construction loans) divided by total loans.
CONSHARE	Consumer loans divided by total loans.
CORERATIO	Transactions deposits (demand & savings) plus time deposits divided by total assets.
FTERATIO	Number of bank employees divided by transactions deposits.
RESHARE	Mortgage loans divided by total loans.
LNASSETS	Natural log of bank assets deflated by RPI based in 2001.
LOANCONC	Loan concentration Herfindahl index, based on share of Consumer, Commercial and Industrial, Agriculture and Fishing and All Other loans.
CCBANK	Dummy = 1 if more than 5% of bank assets are held in credit card loans.
FOREIGNBHC	Dummy = 1 if bank is an affiliate of a bank holding company headquartered in a foreign country.
ATM1	Dummy = 1 if bank has ATM machines.
JOBGROWTH	Growth in employment in Barbados.
LOANQUALITY	Reserve for bad debt divided by total assets.

Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Observations
NIIRATIO1	0.006	0.006	0.019	0.001	0.002	0.907	6.799	351.480	476
LNASSETS	8.273	8.419	9.423	6.018	0.655	-0.838	3.320	57.734	476
RELROA	0.000	0.000	0.013	-0.015	0.004	-0.114	4.329	36.037	476
CORERATIO	0.805	0.830	1.043	0.310	0.102	-0.845	3.468	54.894	428
LOANRATIO	0.430	0.422	1.434	0.085	0.202	1.503	7.908	657.121	476
CONSHARE	0.167	0.171	0.369	0.008	0.071	0.064	3.340	2.617	476
CISHARE	0.452	0.403	0.952	0.094	0.224	0.453	2.110	31.959	476
RESHARE	0.056	0.000	0.559	0.000	0.120	2.706	9.773	839.317	268
LOANCONC	5170.983	5024.500	9073.000	3178.000	1326.896	0.652	3.140	34.153	476
JOBGROWTH	0.021	0.024	0.089	-0.087	0.034	-0.858	4.420	98.425	476
CCBANK	0.015	0.000	1.000	0.000	0.121	8.001	65.015	45804.990	268
FOREIGNBHC	0.782	1.000	1.000	0.000	0.414	-1.363	2.856	147.690	476
FITERATIO	0.002	0.001	0.008	0.001	0.001	2.566	11.836	1444.492	332
ATMI	0.555	1.000	1.000	0.000	0.498	-0.220	1.048	79.380	476
LOANQUALITY	0.014	0.011	0.208	0.000	0.018	4.485	44.623	25078.930	332