

The Performance of Banks in Post-war Lebanon

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ABSTRACT

This paper analyzes the performance and balance-sheet characteristics of banks in post-war Lebanon for the years 1993 to 2000. Although we find that Lebanese banks are profitable, most of them had accounting return on assets (ROA) greater than one percent over most of our test period, they are not as profitable as a control group of banks from five other countries located in the Middle East. Bank safety and soundness in Lebanon has increased as leverage was reduced (capital adequacy improved) and a risk index indicates lower probabilities of book-value insolvency. We attribute this improved bank performance and safety to better management and to three external factors: political (cessation of war), economic (lower inflation), and regulatory (BIS capital requirements). We employ regression models that relate bank profitability ratios to various explanatory variables. We find, for example, that ROA is positively associated with lagged growth in real GDP, spread or net interest margin, and holdings of Lebanese T-bills but negatively related to bank size as measured by the natural log of total assets. As a policy implication, we recommend that Lebanese banks increase their lending to the private sector to achieve a more efficient allocation of resources and to stimulate economic growth. To help achieve this objective, Banque du Liban, the central bank, should abandon its practice of setting T-bill rates above market levels, which provides a disincentive to bank lending.

JEL: G1, G2, L1, O1

Keywords: Lebanese banks; Financial performance; Bank capital; Safety and soundness

I. INTRODUCTION

Profitability in the banking sector has been extensively examined in developed countries, especially in North America and Europe. Evidence from these studies shows that bank profitability depends on several factors. Economic and financial data published by Banque du Liban (the central bank of Lebanon) and Lebanese banks indicate that the Lebanese banking industry has been among the most profitable economic sectors in Lebanon in the post civil-war era. Since no academic work investigating the performance of the banking sector in Lebanon has been published, this paper fills that void. We examine the performance of Lebanese banks during the years 1993 through 2000 and for a control group of banks from five other countries in the Middle East for the years 1995 through 1999. Paucity of information prohibits an exact data matching for the two groups. The return-on-equity accounting model (market data are not available) and a risk-index proposed by Hannan and Hanweck (1988) provide two of the methodological foundations for the univariate analysis. We estimate multiple regression models to attempt to explain the profitability of Lebanese banks. To provide background for the investigation, we also describe the characteristics of the Lebanese economy and its financial sector before, during, and after the civil war in Lebanon.

At the end of the civil war in Lebanon (1990), Charbaji, Mikdashi, and Chebaro [1994] describe Lebanese banks as having “suffered a severe decline in activity and profitability and dissolution of financial capital” (p. 86). Since then, we find that Lebanese banks are profitable but that the high ROEs in the first part of our test period are due more to leverage than profitable use of assets. In addition, we report that 52 control banks across five Middle East countries have greater asset efficiency (higher ROAs) and use less leverage. Various risk measures indicate that bank safety and soundness has improved in Lebanon as, for example, probabilities of book-value insolvency have declined. We attribute this improvement in bank safety to greater recognition by management of the importance of bank capital adequacy and to three external factors: political (cessation of war), economic (lower inflation), and regulatory (e.g., BIS capital requirements). Behind these performance measures, we document and analyze the portfolio characteristics that drive these results. Lebanese banks tend to follow a practice of using the money they receive in Lebanese pound deposits to invest in Lebanese treasury bills, and using the money they receive in US dollar deposits to make US dollar loans.

The paper proceeds as follows. The next section briefly describes the Lebanese economy and banking sector before and during the civil war. The third section focuses on these factors during the post-war period. The fourth section presents the data and our methodological approach. The fifth section analyzes our findings while the sixth section summarizes and concludes.

II. BANKING AND ECONOMIC ACTIVITY BEFORE AND DURING THE CIVIL WAR IN LEBANON¹

Prior to the civil war, specifically between the 1950s and mid-1970s, real GDP in Lebanon grew at an average annual rate of six percent and the annual inflation rate was

a modest three percent. Over this period, the Lebanese banking industry flourished due to a strict banking secrecy law, which was introduced in 1956, and the flow of the petrodollars from the Arab world, a free-market economy, and a free exchange-rate system. In fact, Lebanon was the banking center of the Middle East. At one time, 100 domestic and foreign banks operated in Lebanon in the mid-1960s, mainly in Beirut, which also flourished as the social and cultural center of the region under the rubric "Paris of the Middle East."

The civil war, which started in April of 1975 and ended in October of 1990, had devastating effects on the Lebanese economy. A substantial proportion of the Lebanese labor force was killed or left the country. The Lebanese industrial, agricultural, and tourism sectors were devastated. Nominal per capita income was around \$820 in 1990, equivalent, in real terms, to about one-third of the per capita income in 1975.

Table 1–Panel A
Economic and financial data

ECONOMIC GROWTH IN LEBANON (1991-2000)					
Year	GDP (Trillions of Lebanese Pounds)	GDP (Equivalent in Billions of US\$)	Average Exchange Rate (Cost of US\$ in LP)	Real GDP Growth	Inflation Rate (GDP Deflator)
1991	4.1	4.5	928	38.2%	51.5%
1992	9.5	5.5	1,713	4.5%	120.0%
1993	13.1	7.5	1,741	7.0%	29.1%
1994	15.3	9.1	1,680	8.0%	8.0%
1995	18.0	11.1	1,621	6.5%	10.6%
1996	20.4	13.0	1,571	4.0%	8.9%
1997	22.9	14.8	1,539	4.0%	7.7%
1998	24.5	16.2	1,516	3.0%	4.0%
1999	24.8	16.4	1,508	1.0%	0.2%
2000	24.8	16.4	1,508	0%	0%

Source: Banque du Liban, "Financial Markets Handbook"

The economic consequences of the civil war extracted a heavy price from the Lebanese banking sector as well. Specifically, hyperinflation and severe depreciation in the value of the currency led to disintermediation and declining loan values. For example, the average exchange rate depreciated from US\$ = 2.29 LP in 1975 to US\$ = 701.76 LP in 1990. Since 1998, the exchange rate has been pegged around US\$ = 1,508 LP (Table 1, Panel A). Many bank customers pulled their funds out of Lebanese banks and reinvested them in banks and other financial institutions abroad (disintermediation). With bank borrowers under stress, bank profits turned to losses as loan default rates soared. Capital resources of Lebanese banks, the final line of defense for any bank,

were reduced dramatically and most banks became undercapitalized. In this environment, some banks went out of business. Nevertheless, the majority of Lebanese banks managed to survive the civil war and some of them even managed to open branches in foreign countries. Not surprisingly, foreign banks, such as Bank of America, Citibank, First National Bank of Chicago, and Bank of Nova Scotia withdrew from Lebanon during the civil war.

Table 1–Panel B
Economic and financial data

Summary of Lebanese Pound (LP) / US Dollar Exchange Rates, Average Yields on Various Financial Instruments and Inflation Rates, 1993-2000								
Variable	1993	1994	1995	1996	1997	1998	1999	2000
LP/US\$ Exchange Rate at end of year	1,711	1,647	1,596	1,552	1,527	1,508	1508	1508
Average Rates on 3 months t-bills (in LP) %	18.70	15.09	18.88	15.19	13.42	12.70	11.57	10.88
Average Rates on 6 months t-bills (in LP) %	19.94	17.21	20.65	16.93	14.30	13.78	12.74	11.43
Average Rates on 12 months t-bills (in LP) %	21.42	18.67	24.59	17.88	15.25	15.17	14.38	11.84
Average Rates on 24 months t-bills (in LP) %	25.32	19.23	23.36	22.79	16.83	16.72	15.89	14.14
Average Rate on all T-bills (in LP) %	21.35	17.55	21.87	18.2	14.95	14.59	13.65	12.07
Average Rates On Bank Deposits in LP %	12.78	13.16	15.14	14.71	12.68	12.97	11.94	10.68
Average Discount and Loans Rates in LP %	28.53	23.88	24.52	25.21	20.29	20.24	19.48	18.15
Spread Between Average Rates on t-bills and Rates on Deposits (in LP) %	8.57	4.39	6.73	3.49	2.27	1.62	1.71	1.39
Spread Between Average Rates on Discount and Loans and Average Rates on Deposits in LP %	15.75	10.72	9.38	10.50	7.61	7.27	7.54	7.47
Repo Rate (in LP) %	31.61	30.00	43.75	27.83	27.08	30.00	27.92	20.83
Inter-Bank Rate in LP %	6.60	7.33	34.88	11.19	13.00	11.23	7.46	7.58
Average Discount and Loans Rates in US\$ %	NA	NA	12.03	11.91	11.76	11.54	10.95	11.19
Average Rates On Bank Deposits in US\$ %	NA	NA	5.29	5.41	5.72	5.89	5.60	5.92
Spread Between Average Rates on Discount and Loans and Average Rates on Bank Deposits in US\$ %	NA	NA	6.74	6.5	6.04	5.65	5.35	5.27
Rate of Inflation %	29.1	8.0	10.6	8.9	7.7	4.0	0.2	0.0

Note: A few outliers exist in the data. The average inter-bank rates were 275% and 43% in May and August, 1995, respectively. The average inter-bank rates were 45% and 36% in September 1997 and December 1998, respectively.

Sources: Banque du Liban website, Banque du Liban, "Financial Markets Handbook"

During the war, the Lebanese economy became dollarized and those customers that continued to support Lebanese banks tended to keep their funds in US dollar deposits rather than Lebanese pound deposits. With slack loan demand and the government trying to fund the war effort, Lebanese banks increased substantially the proportion of their assets held in Lebanese treasury bills, which coincidentally offered high yields. Although foreign investments in the country were reduced, a substantial amount of funds kept flowing into the country, either from Lebanese living and working abroad or from parties and countries that were helping to finance the militias that were fighting each other.

By the end of the civil war, although total assets of the Lebanese banking sector had increased, in nominal terms, from about \$4.7 billion in 1975 to \$5.7 billion in 1990, they had declined in real terms because of inflation. Regarding personnel and facilities, a paucity of both existed as Lebanese bank employees lacked modern training and facilities lagged substantially behind those in developed countries.

After the cessation of the civil war in October of 1990, some of the foreign banks that had left Lebanon during the war returned, including Citibank, Bank of Nova Scotia, and ING Bank. In addition, new foreign banks opened branches in Lebanon, e.g., Commerzbank and Berliner Bank. The resurgence of the banking sector, including a substantial amount of foreign investment, provided the funds needed to begin rebuilding Lebanon. As vital as financial capital is to a banking system, the restoration of reputational capital (confidence) also was critical. With confidence in the banking sector growing, the future of Lebanon began to look brighter. We now turn to a look at Lebanon during the post-war period.

III. THE LEBANESE ECONOMY AND BANKING ENVIRONMENT DURING THE POST-WAR PERIOD

With a population of nearly four million and a gross domestic product equivalent to US\$16.4 billion (1.7% of US GDP), Lebanon had a per capita income of roughly \$4,100 in 2000 compared to \$35,000 in the US. Four sectors form the backbone of the economy: agriculture, trade, services, and tourism. Although the civil war in Lebanon ended in 1990 and the political and social situation in Lebanon improved during the 1990s, the overall environment has not been conducive to economic growth. This shortcoming restricted the economy's potential, especially with respect to tourism, which until the late 1990s was depressed because of uncertainty regarding safe travel conditions.² Recently, however, Beirut has been attempting to reclaim its title as the "Paris of the Middle East."

Panel A of Table 1 shows some basic data for the Lebanese economy for the years 1991 to 2000. Nominal GDP (in US\$) grew at an annual average rate of 12 percent over this period but inflation cut real growth considerably to 4.2 percent per annum (excluding 1991). During 2000, although the inflation rate was down to zero percent (from 120 percent in 1992), real GDP growth also was zero percent. During the 1990s and continuing today, the Lebanese economy faces challenges with respect to (1) government-budget deficits, (2) current-account deficits, (3) high interest rates, and (4) high unemployment. We address these four areas next.

A. Budget Deficits

The Lebanese public infrastructure was badly damaged during the civil war. In the years following the conflict, the government incurred large capital expenditures, financed mainly by issuing treasury bills and notes rather than by taxes. Since 1994, deficits have been around LP 3 trillion (equivalent to US\$2 billion) every year. Even though capital expenditures have been reduced, the government is making substantial interest payments on its accumulated debt. The current net total debt of Lebanon stands at LP 45.4 trillion (equivalent to US\$30 billion), more than 100 percent of the nation's gross domestic product.

B. Current-Account Deficits

Lebanon has had large trade deficits in recent years. In 2000, for example, exports of goods amounted to the equivalent of US\$714 million while imports of goods amounted to the equivalent of US\$6.2 billion. Lebanon's exports are primarily to countries in the Middle East while its imports are primarily from European countries. The Lebanese economy has a substantial surplus in services, primarily derived from tourism.³ Despite having substantial current-account deficits, a positive balance of payments has existed in the post-war period. This positive balance has been propped up by external capital inflows and from remittances by Lebanese living outside Lebanon to family members in Lebanon.⁴

C. High Interest Rates and High Unemployment

Large government borrowings during the post-war period have put substantial pressures on financial markets. To induce investors to buy treasury bills and notes, the Lebanese government offers high interest rates on its debt obligations. Panel B of Table 1 shows that the yield on three-month treasury bills has averaged 14.6 percent while the yield on two-year treasury notes has averaged 19.29 percent for the years 1993 to 2000. The average rate on all treasury obligations has declined, however, dropping from 21.4 percent in 1993 to 12.07 percent in 2000. The combined effects of high interest rates, rising wages, and a currency that has risen vis-a-vis its major trading partners has dampened real economic growth over the past few years. Although inflation has slowed down considerably, the economy is still experiencing substantial unemployment.

D. Financial Markets and Interest Rates

Financial markets in Lebanon are underdeveloped compared to industrialized nations in Europe or standards in North America. Lebanon has one stock exchange, the Beirut Stock Exchange, but only 14 companies with a total market capitalization of approximately \$3 billion were listed on the exchange at the end of 2000. The stocks of six additional companies were traded over the counter. Although no bond market exists in Lebanon, some large Lebanese banks issue bonds in European markets. In addition, there is no money market in Lebanon. Moreover, since the Lebanese government's treasury bills and notes are only quasi-marketable securities, no secondary market exists where investors can trade treasury securities. The only liquidity for treasury securities is provided by the central bank, which buys back its obligations but only at a substantial discount.

Panel B of Table 1 shows the average yields on three-month and 24-month treasury obligations and average interest rates on Lebanese pound loans and deposits for the years 1993 to 2000. Overall, interest rates were high and volatile compared to those in other industrialized countries throughout the period. For example, the yield on the three-month treasury bills averaged 18.7 percent in 1993, fell to 15.1 percent in 1994, went up to 18.9 percent in 1996, but then fell to 10.9 percent in 2000. The yields on treasury bills of other maturities followed a similar pattern.

The average interest rates on discounts and loans denominated in Lebanese pounds were exceptionally high from 1993 to 2000. For example, the average LP loan rate was 28.5 percent in 1993 but fell to 18.2 percent in 2000.⁵ In contrast, the average LP deposit rate was 12.8 percent in 1993, went as high as 15.1 percent in 1995, but dropped to 10.7 percent in 2000. The data show that the interest rates paid on LP loans are less volatile than the yields on Lebanese treasury bills. For purposes of comparison, Panel B of Table 1 also presents the inflation rate for each year.

Lebanese banks offer loans and deposits denominated in US dollars (USD) as well as those denominated in Lebanese pounds. The average interest rates on USD loans and deposits are much lower than those denominated in LP, but are still higher than the yields on financial instruments in the US. Panel B of Table 1 shows the average USD loan and deposit rates for the years from 1995 to 2000.⁶ Rates on deposits ranged from 5.29 percent (1995) to 5.92 percent (2000) while loan rates ranged from 12.03 percent (1995) to 11.19 percent (2000).

E. Business Structure

Most businesses in Lebanon are family-owned organizations that mainly finance themselves by issuing stock to family and friends and by obtaining loans from banks. As a result, banks should play an important role in commercial finance but, as we document below, they come up short in their pivotal role of allocating resources more efficiently. The main problem is the high yield on Lebanese treasury obligations, which discourages lending to the private sector. The high yields are costly to investors, however, as Lebanese treasury obligations do not have well-developed secondary markets and the central bank only liquidates them at a substantial discount.

F. Banking Structure and Regulation

There are five major types of financial intermediaries in Lebanon: (1) commercial banks, (2) banks specializing in medium and long-term credit, (3) money dealers, (4) financial institutions that would be regarded as investment banking firms, and (5) brokerage firms. In addition to these institutions, a number of foreign banks have representative offices in Lebanon. As of year-end 2000, a total of 59 commercial banks existed in Lebanon, 17 of which were subsidiaries of foreign banks. Seven banks specialize in medium- and long-term credit by providing residential mortgage loans or long-term loans to businesses secured by property. Money dealers are primarily small retail foreign-exchange dealers and do not provide loans or take deposits. At the end of 2000, there were 28 financial institutions in Lebanon that would be referred to as investment banks in North America; these firms are relatively small in size and assist firms in obtaining long-term financing and also trade securities on behalf of customers. In addition, there were five brokerage institutions that trade securities on behalf of customers but do not underwrite securities.

Banks are required to have shareholders capital of at least 10 billion Lebanese pounds (US\$6.7 million) plus 250 million Lebanese pounds (US\$167,000) for each branch.⁷ Banks are required to keep reserves of 13 percent, but some of these reserves can be invested in treasury bills. Banks are also required to comply with the BIS risk-based-capital (RBC) requirements.

IV. DATA AND METHODOLOGY

We draw the initial sample of banks for this study from issues of Bilanbanques⁸ from 1993 to 2001. Similar to other countries, individual banks furnish the financial data for these reports. All banks in Lebanon are included in our sample except those (1) owned by the government, (2) classified as investment banks, or (3) do not report income-expense and balance-sheet data in Bilanbanques.⁹ The number of banks included in our sample varies by year and ranges from 66 to 54 with 65 in 1993, 65 in 1994, 66 in 1995, 64 in 1996, 62 in 1997, 52 in 1998, 59 in 1999, and 54 in 2000. Overall, our sample captures approximately 92 percent of all commercial banks in Lebanon.¹⁰ We compare our sample banks with a control group of 52 banks from five countries, including United Arab Emirates (18 banks), Saudi Arabia (10), Kuwait (8), Bahrain (9), and Oman (7). Our comparisons, however, are limited because we only have two profitability measures and a leverage factor for our control banks.

A. Descriptive Methods

We use several approaches to analyze the performance of our sample banks, including univariate (descriptive) tests and multivariate analyses. First, we employ the accounting return-on-equity (ROE) model to investigate profitability and leverage, that is, $ROE = ROA \times EM$, where $ROA = \text{return on assets}$ and $EM = \text{equity multiplier}$. Three variables, total assets, total equity, and profits, define these three ratios with $ROE = \text{profits/equity}$, $ROA = \text{profits/assets}$, and $EM = \text{assets/equity}$. In addition, we analyze

the components of bank profitability by focusing on net interest margin (NIM = net interest income/total assets) and operating expenses. Since the portfolios of assets and liabilities that banks hold drive these cash flows, we also examine these balance-sheet characteristics.

To investigate bank riskiness and the probability of book-value insolvency, we employ the risk index suggested by Hannan and Hanweck [1988] and used by various other researchers, for example, Liang and Savage [1990], Eisenbeis and Kwast [1991], Sinkey and Nash [1993], Nash and Sinkey [1997], and Blasko and Sinkey [2004]. The empirical version of the risk index we employ is calculated as follows:

$$RI = (\overline{ROA} + EM^{-1}) / \sigma_{ROA} \quad (1)$$

where \overline{ROA} is average return on assets,¹¹ EM^{-1} is the reciprocal of EM or the ratio of shareholders' equity to total assets, and σ_{ROA} is the standard deviation of ROA. Hannan and Hanweck [1988] derive the upper bound probability of book value insolvency (p) and show that it equals $1/[2(RI)^2]$. Thus, for example, if a bank has $RI = 2.0$, its probability of book-value insolvency would be 12.5 percent; in contrast, if $RI = 50$, then $p = 0.02$ percent.

B. Regression Framework

To complement the univariate methods described above, we employ multiple regression analysis to attempt to explain the profitability of Lebanese banks over the years 1993-2000. Our models build on the existing empirical literature including Bourke (1989), Molyneux and Thornton (1992), Berger (1995), Goldberg and Rai (1996), Neely and Wheelock (1997). Using ROE and ROA as alternative dependent variables, we test various regression models in which independent variables attempt to capture relationships between profitability and the level of interest rates, capital structure, concentration, government ownership and changes in per capita income. In addition, we test the relationship between bank profitability and size,¹² asset portfolio composition, off-balance sheet items, ownership by a foreign bank, and the ratio of employment to assets. We do not test the relationship between profitability and changes in per capita income or concentration, since we lack detailed data to test regression models that include our control group of banks from outside Lebanon. In addition, we do not test the relationship between profitability and government ownership because the few government-owned banks in Lebanon are special-purpose banks that are not included in our sample of banks.

V. EMPIRICAL FINDINGS

This section first presents our univariate or descriptive findings followed by our regression results.

A. Balance-Sheet Characteristics

Lebanese banks had average total assets of 1,316 billion Lebanese pounds (approximately US\$869 million) at the end of 2000. Total assets grew at a compound annual rate of 25 percent from 1993 through 2000. In contrast, since total equity capital grew at a compound rate of almost 48 percent, our sample banks reduced their leverage substantially. All other things being equal, Lebanese banks became safer (i.e., the traditional notion of bank capital as a buffer or cushion for absorbing losses) over our test period as EM declined from 46.7 (1993) to 15 (2000) based on ratios of the aggregate data. Averages of individual bank's EMs show a similar improvement as EM (= ROE/ROA) declined from 79.69 (1993) to 7.8 (2000). Based on either measure, we attribute this improvement in bank safety to four factors: political (cessation of war), economic (lower inflation), regulatory (BIS capital requirements), and managerial (greater recognition of the importance of capital adequacy and risk management).

The assets of banks in Lebanon can be classified into four broad categories: (1) treasury bills denominated in Lebanese pounds (LP), (2) loans denominated in LP, (3) loans denominated in foreign currencies (USD), and (4) other assets. Table 2 shows the average proportion of total assets invested in each of these asset-classes for the banks in our sample.

The macroeconomic environment and local traditions have some interesting effects on the portfolio composition of Lebanese banks. Because of huge government deficits and the decline of the Lebanese pound during the civil war, many Lebanese people distrust their own currency. Table 2 shows loan and deposit data that capture these effects. For example, at year-end 2000, the average deposit-to-asset ratios were 27 percent in LP but 49 percent in USD. The highest LP deposit-to-asset ratio was 30 percent (1996) while the highest USD deposit-to-asset ratio was 55 percent (1993). The loan-to-asset ratios reveal an even stronger preference for USD loans over LP loans. For example, at year-end 2000, the ratios were 26 percent and 4.7 percent, respectively. A loan-to-asset ratio of only 30.7 percent would be considered small (and unacceptable) in industrialized nations. Bank lending in Lebanon is primarily to business firms. The residential mortgage market is small in Lebanon and banks have only a small proportion of their assets invested in such loans; traditionally, young people in Lebanon buy homes by obtaining financing from relatives rather than borrowing from financial institutions.¹³

If Lebanese banks have less than 31 percent of their assets in the form of loans, what do they do with their funds? The high yield on LP treasury securities (Table 1, Panel B) makes them an attractive investment for Lebanese banks. Table 2 shows that our average sample bank had 21 percent of its total assets invested in LP treasury securities at the end of 2000. Over our test period, this ratio ranged from 21 percent (1993) to 29 percent (1996).

The composition of total assets also varied among banks as shown by the standard deviations of the balance-sheet ratios. The most obvious trend over time has been the relative increase in the proportion of total assets invested in treasury bills and the relative decrease in the proportion of assets invested in other assets.

Table 2 Statistical description of selected balance sheet ratios. Total Equity to Total Assets (*Equity/Assets*), Investment in Lebanese Pounds Treasury Bills to Total Assets (*LPtills/Assets*), Lebanese Pounds Discounts and Loans to Total Assets (*LPloans/Assets*), Foreign Currencies Discounts and Loans to Total Assets (*FCloans/Assets*), Lebanese Pounds Deposits to Total Assets (*LPdeposits/Assets*), Foreign Currencies Deposits to Total Assets (*FCdeposits/Assets*), Other Assets to Total Assets (*OtherAssets/Assets*), and Off-Balance Sheet Assets to Total Assets (*Off-balance/Assets*).

Variable	1993		1994		1995		1996		1997		1998		1999		2000	
	Mean	Stand Dev														
Equity/Assets ¹	0.036	0.05	0.042	0.04	0.10	0.14	0.086	0.053	0.118	0.105	0.115	0.10	0.099	0.072	0.094	0.063
LPtills/Assets	0.21	0.10	0.255	0.11	0.25	0.11	0.29	0.12	0.235	0.116	0.24	0.12	0.30	0.14	0.214	0.11
LPloans/Assets	0.043	0.56	0.056	0.064	0.06	0.077	0.057	0.058	0.061	0.062	0.052	0.065	0.056	0.074	0.047	0.056
FCloans/Assets	0.26	0.12	0.25	0.10	0.26	0.12	0.25	0.095	0.25	0.10	0.26	0.10	0.27	0.11	0.26	0.11
LPdeposits/Assets	0.23	0.10	0.27	0.11	0.254	0.11	0.30	0.12	0.24	0.12	0.233	0.125	0.32	0.15	0.27	0.144
FCdeposits/Assets	0.55	0.17	0.47	0.15	0.446	0.16	0.427	0.14	0.46	0.14	0.45	0.16	0.44	0.15	0.494	0.131
OtherAssets/Assets ²	0.48	0.15	0.44	0.15	0.426	0.154	0.40	0.15	0.454	0.14	0.45	0.16	0.374	0.14	0.48	0.107
Off-balance/Assets ³	0.10	0.09	0.11	0.10	0.11	0.10	0.11	0.12	0.11	0.13	0.12	0.13	0.094	0.077	0.09	0.08

N is the sample size.

¹ The equity-to-asset ratio for 1995 excludes an outlier (new bank) with a ratio of 0.98.

² Other Assets are equal to (Total assets - Lebanese Pounds T-bills - Lebanese Pounds Loans - Foreign Currencies Loans). This residual category includes 15 items: (1) Cash and Deposits with Central Bank, (2) Bonds and Fixed-Income Investments (other than Lebanese Treasury Securities), (3) Other Marketable Securities (other than Lebanese Treasury Securities), (4) Deposits with banks and other financial institutions, (5) Deposits with Affiliates, (6) Bank Acceptances, (7) Investments and Loans to Related Parties, (8) Investments in Related Parties, (9) Tangible Fixed Assets, (10) Intangible Fixed Assets, (11) Other Assets (12) Regularization Accounts and Miscellaneous Debtor Accounts, (13) Revaluation of Other Fixed Assets, (14) Goodwill, and (15) Investments in Foreign Currencies T-bills.

³ Off-balance sheets activities for Lebanese banks include guarantees and standby letters of credits (the largest of the items), documentary and commercial letters of credit, fiduciary deposits, and interest-rate swaps.

We calculate “other assets” as a residual item, which equals total assets net of loans (in LP and USD) and treasury bills (in LP and USD). As defined, other assets include 15 items, none of which dominate the category. Table 2 provides a list of the components of this asset class. Over our sample period, the ratio of other assets to total assets ranged from a high of 48 percent in 1993 to 37.4 percent in 1999. At the end of our sample period, it was 48 percent.

Off-balance sheets activities (OBSAs), which for Lebanese banks include guarantees and standby letters of credits (the largest of the items), documentary and commercial letters of credit, fiduciary deposits, and interest-rate swaps, have not kept pace with the growth of total assets. As a percent of total assets, OBSAs have varied between 10 and 12 percent over the period.

Lebanese banks have two major sources of funds: deposits denominated in Lebanese pounds (LP) and deposits denominated in US dollars (USD). Table 2 presents the average proportion of total assets financed by LP and USD. The data show that the proportion of assets financed by foreign currency deposits has decreased since 1993. The proportion financed by Lebanese pound deposits increased between 1993 and 2000. The data also show that liability-management practices differ among banks.

B. ROE and ROA Profit Measures

Table 3 presents ROE and ROA for our sample banks. Both measures were computed using average shareholders' equity and average total assets. For each of our eight sample years, the means and standard deviations are shown. Since $ROE = ROA \times EM$, ROE mixes profitability and leverage. Thus, ROA is the preferred accounting measure of a firm's profitability from the perspective of asset efficiency. The difference between ROE and ROA arises from the leverage factor, EM, which can be derived as ROE/ROA . Using a benchmark ROA of one percent as a minimum performance standard,¹⁴ our sample banks pass this test, except in 1993 (ROA = 0.64%), 1999 (ROA = 0.70%), and 2000 (ROA = 0.59%). Since 1996, ROA has been declining, dropping about 55 percent from 1.3 percent in 1996 to 0.59 percent in 2000. The high ROEs in 1993 (51%) and 1994 (52%) were driven by high degrees of financial leverage as EM was 79.69 in 1993 and declined to 47.27 in 1994. The reduced leverage¹⁵ was more than offset, however, by the jump in ROA from 0.64 percent to 1.1 percent, hence ROE increased.

Table 3 Profitability and Risk Measures including Return on Average Equity (ROE), Return on Average Assets (ROA), Net Interest Margin (NIM), Risk Index [RI, Blasko & Sinkey], [RI, Eisenbeis & Kwast], and the probability of book-value insolvency (Probability).

Variable	1993		1994		1995		1996		1997		1998		1999		2000	
	Mean	Stand Dev	Mean	Stand Dev	Mean	Stand Dev	Mean	Stand Dev	Mean	Stand Dev	Mean	Stand Dev	Mean	Stand Dev	Mean	Stand Dev
ROE ¹	0.51	1.01	0.52	0.95	0.23	0.27	0.20	0.21	0.153	0.18	0.143	0.14	0.077	0.13	0.046	0.27
ROA ²	0.0064	0.018	0.011	0.021	0.010	0.012	0.013	0.016	0.011	0.018	0.012	0.012	0.007	0.011	0.0059	0.011
NIM ³	0.041	0.019	0.039	0.017	0.042	0.017	0.051	0.076	0.037	0.021	0.032	0.015	0.028	0.014	0.028	0.011
Coefficient of Variation ⁴	2.81	NA	1.91	NA	1.20	NA	1.23	NA	1.64	NA	1.00	NA	1.57	NA	1.86	NA
RI (Blasko & Sinkey) ⁵	8.44	9.23	8.29	6.97	14.43	13.05	14.37	13.29	17.43	15.00	15.72	12417	15.48	12.08	15.70	1211
Probability ⁷	0.044	0.1	0.044	0.105	0.032	0.018	0.01	0.02	0.013	0.044	0.0093	0.023	0.012	0.032	0.019	0.073
RI (Eisenbeis & Kwast) ⁶	2.36	NA	2.52	NA	8.67	NA	6.19	NA	7.17	NA	10.58	NA	9.63	NA	9.08	NA
Probability ⁷	0.09	NA	0.079	NA	0.007	NA	0.013	NA	0.010	NA	0.0044	NA	0.0054	NA	0.0064	NA

N is the sample size.

¹ Three observations in 1993 and one other observation in 1994 are eliminated when we calculated ROE because in each of those four cases the bank equity is negative.

² ROE and ROA are equally weighted Return on Average Equity and Return on Average Assets, respectively. The weighted ROEs (total profits / total equities of all banks in the sample) from 1993 through 2000 are respectively, 45%, 42%, 16.42%, 20%, 18.9%, 17.4%, 14.5%, and 12.8%. The weighted ROAs (total profits / total assets of all banks in the sample) from 1993 through 2000 are respectively, 1.0%, 1.12%, 1.0%, 1.20%, 1.32%, 1.20%, 1.0%, and 0.86%.

³ NIM is equal to (Interest and similar income - Interest and similar charges) divided by average assets.

⁴ Coefficient of Variation is a relative measure of variation and is equal to standard deviation of ROA / mean of ROA.

⁵ RI (Blasko & Sinkey) is a risk or safety index used by Blasko & Sinkey, which is equal to (average of ROA + Equity/Assets) / Standard Deviation of ROA] for each bank. RI is calculated for each bank and then averaged for each year.

⁶ RI (Eisenbeis & Kwast) is an alternative risk or safety index following Eisenbeis & Kwast who used cross-sectional components of ROA, Equity/Assets, and standard deviation for each year, which gives one RI for each year. Safe or low-risk banks have high RIs while high-risk banks have low RIs.

⁷ Probability is equal to $1/[2(RI)]^2$.

Table 4

The return-on-equity model based on pooled data for 52 control banks across five middle east countries: United Arab Emirates (18 banks), Saudi Arabia (10), Kuwait (8), Bahrain (9), and Oman (7)

Year	Return on equity (ROE)	Return on assets (ROA)	Equity multiplier (EM)
1995	0.1218	0.0163	7.47
1996	0.1348	0.0190	7.08
1997	0.1498	0.0213	7.05
1998	0.1284	0.0182	7.04
1999	0.1232	0.0181	6.80
Grand mean	0.1316	0.0186	7.09
Standard deviation	0.0114	0.0018	0.24

Memo: Grand risk index (Eisenbeis and Kwast) = 88.8 [= (0.0181 + 1/7.09)/0.0018] with a probability of book-value insolvency of 0.01 percent. Appendix A shows ROE and ROA by country for the banks that comprise our control group.

Source: Various Publications and Databases of the Research Unit of the Institute of Banking Studies (IBS), Kuwait. This source contains the following disclaimer: "Please note that, information given here was prepared by the Research Unit of the IBS from various sources. Every effort has been taken to collect, classify, analyze and present the information given here, as accurately as possible. However, the Institute or its Researchers would not be responsible for any human or mechanical errors, if any in this respect."

Table 4 presents ROE, ROA, and EM for our control group of 52 banks. These aggregate data (see Appendix A for the data by country) reveal that the banks in these five countries have greater asset efficiency (the grand mean for ROA is 1.86%) but employ less leverage (EM is only 7.1 on average). Using 1999 to illustrate, the following ROE profiles are insightful:

$$\text{Lebanese banks: ROE} = \text{ROA} \times \text{EM} = 0.0770 = 0.0070 \times 11.0$$

$$\text{Control group: ROE} = \text{ROA} \times \text{EM} = 0.1232 = 0.0181 \times 6.8$$

In terms of risk exposure, measured by the variability of ROA, our control banks are much safer as the standard deviation of ROA (1995-1999) was only 0.18% compared to 1.4% for our sample banks over the same period. On balance, while Lebanese banks are profitable in their own right, they pale in comparison to our control banks. We suspect a major reason for this difference is the fact that the majority of our control banks are located in countries with steady oil revenues while Lebanon is an oil-dependent country.

C. Net Interest Margin

Since traditional banking is the business of funding loans with deposits, a bank's net interest margin [NIM = (interest income – interest expense)/average assets] is a key performance measure that drives ROA. Table 3 presents NIMs for our sample banks. They averaged about 4 percent for the years 1993 to 1995. They peaked in 1996

(NIM = 5.1 percent), but since then they have declined steadily, dropping to 2.8 percent in 2000. The culprit in the declining NIM has been interest expense per dollar of assets, which rose from 6.0 percent in 1993 to 7.1 percent in 2000, reaching a peak at 7.7 percent in 1996. Of course, as NIM goes, so goes ROA, which, all other things being equal, accounts for the declining ROA. To maintain ROA in the face of declining interest-rate spreads, banks must increase noninterest income or improve operating efficiency or both.

D. Efficiency Measures

Table 5 presents several measures of operating efficiency for Lebanese banks. To cushion the effect of declining NIM on ROA, Lebanese banks have been reducing their operating expense per dollar of assets, which declined from 4.1 percent (1993) and 4.2 percent (1994) to 2.52 percent (2000). An alternative measure of operating efficiency, the ratio of total cost to income, has shown similar improvement dropping from 83 percent in 1993 to 71 percent in 1998 but then increased in 1999 (82 percent) and 2000 (84 percent).

Except for the latest Internet-only banks (none of which exist in Lebanon as of this writing), banks have labor-intensive operations. Therefore, it is important to analyze the “staff expenses” of Lebanese banks. Table 5 shows that the ratio of staff expenses relative to total operating expenses had a shallow inverted U-shape over our test period, rising from 52 percent (1993) to a peak of 60 percent (1997) before dropping to 56 percent (1999). However, in 2000 this ratio rose again to 62 percent. Over this same period, staff expenses per employee more than doubled rising from LP16.47 million (1993) to LP39.52 million (2000), or in USD from roughly \$9,600 to \$26,100.

E. Loan Quality

Since information on loan quality is scarce in Lebanon, we have little to report on this topic. The only measure we have is the “provision for loan loss” (PLL), which in Lebanon is not the noncash outlay but the actual reserve account, known in the US as the loan-loss reserve or allowance for loan and lease loss. As a percent of total loans, the loan-loss reserve was 17.4 percent in 1994 but dropped to 14 percent in 1998 and rose again to 16 percent in 2000. By US standards, where two percent is a benchmark, the ratio is high. However, the relatively low level of lending by Lebanese banks accounts for this substantial difference. On balance, Lebanese banks do not make many loans but they keep a high level of reserves relative to the loans that they do make. Perhaps, the political uncertainty of the country leads to this conservative behavior.

Table 5 Efficiency measures: statistical description of selected expense ratios.

Variable	1993		1994		1995		1996		1997		1998		1999		2000	
	Mean	Stand Dev														
General Operating Expenses / Total Assets	0.041	0.026	0.042	0.025	0.039	0.02	0.036	0.016	0.031	0.013	0.027	0.013	0.026	0.013	0.022	0.010
Cost / Income ¹	0.83	0.18	0.73	0.28	0.75	0.26	0.75	0.27	0.71	0.24	0.71	0.27	0.82	0.38	0.84	0.51
Staff Expenses / Operating Expenses	0.52	0.11	0.57	0.098	0.58	0.10	0.60	0.11	0.60	0.093	0.58	0.11	0.56	0.093	0.62	0.10
Staff Expenses / Number of Employees	16.47	6.06	23.39	13.06	26.85	8.71	32.46	11.06	33.77	12.78	36.93	13.93	38.04	12.82	39.52	12.55
Interest Expenses / Total Assets	0.06	0.025	0.070	0.028	0.074	0.023	0.077	0.021	0.072	0.019	0.066	0.022	0.068	0.02	0.071	0.024
Loan Loss Provisions / Total Loans	NA	NA	0.174	0.17	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.13	0.14	0.12	0.16	0.13

N is the sample size.

¹ Cost = (general operating expenses + allocation to provision & depreciation of fixed assets + net allocation to provisions on financial fixed assets) and Income = net financial income.

F. Risk Measures

Table 3 also shows the risk index (RI) we calculated.¹⁶ The probability of book-value insolvency (p) equals $1/[2(RI)^2]$. The average RI for a censored sample of banks, which excludes low outliers, increased steadily from 8.44 ($p = 4\%$) in 1993 to 15.7 ($p = 1.9\%$) in 2000. On balance, the conclusion is that, on average, the safety of banks in Lebanon increased and their associated probability of book-value insolvency declined over the years 1993 to 2000. In contrast, our control banks (see Table 4) have a risk index of 88.8 ($p = 0.01\%$). The higher ROA and lower variability of ROA for the control banks account for the substantial difference between the risk indices. Thus, on a cross-country basis Lebanese banks do not look as strong as our control banks; on average, however, the trend in their financial strength has been favorable, although slipping a bit recently.

Another measure of risk we employ is the variability of ROA as measured by its standard deviation. Table 3 shows that this cross-sectional sigma has ranged from 2.1 percent (1994) to 1.1 percent (2000), another indicator of the reduced riskiness of Lebanese banks. This favorable trend, however, can be put in perspective by noting that our control banks (Table 4) show much less variability of ROA (0.18%). The coefficient of variation (standard deviation of ROA/mean ROA) is a relative measure of dispersion. Over our sample period, it has declined from 2.81 in 1993 to 1 in 1998, and then has risen to 1.86 in 2000. Although we do not have a year-by-year estimate for the coefficient of variation for our control group, we note that it was 0.1 for the period 1995 to 1999.

To recap, all three measures of risk, the risk index, the standard deviation of ROA, and the coefficient of variation of ROA, indicate that Lebanese banks became safer in 2000 than in 1993 and 1994 but this safety has started to decline since 1997 when it reached its peak. Compared to our control banks, however, Lebanese banks are not as profitable or as safe.

G. Differences due to Size

The average Lebanese bank, as measured by total assets, nearly quadrupled its size between 1993 and 2000; the distribution of total asset size, however, is highly skewed as the standard deviation of asset size is larger than the mean average for every one of the six years.¹⁷ To test for the effects of size on the performance and characteristics of Lebanese banks, we split our sample at the median asset size and examine the groups above and below the median. We find several interesting results.¹⁸ First, with respect to profitability, no significant differences exist for ROA. However, the ROE of the larger banks is significantly higher in each of the years because they employ greater leverage than smaller banks. In contrast, the group of larger banks has, on average, significantly lower NIM than smaller banks in seven of the eight years. This profile of larger banks having lower capital ratios and lower NIMs is similar to the one observed for US banks (Basset and Zakrajsek, 2000). The risk indices across the two groups are not significantly different as the group of larger banks has, on average, ROAs that are more stable to offset its lower ratio of capital to assets.

The similar ROAs between the two size groups come about differently. The group of larger banks has significantly higher staff expenses per employee but significantly lower operating expenses per dollar of assets. However, the bigger banks have higher interest expenses per dollar of assets across all eight years.

Behind the cash-flow differences described above, the following portfolio differences exist between large and small banks. First, the bigger banks have significantly higher USD deposits as a percent of total assets for all eight years, e.g., 54 percent vs. 45 percent at year-end 2000. This difference probably accounts for the higher interest expenses per dollar of assets for the bigger banks. For the loan portfolio, the average larger bank makes more USD loans as a percent of assets (significantly so for the years 1995 and 1996) but significantly less LP loans as a percent of assets for the entire period.

H. Regression Models and Estimates

We establish and test possible explanations for variations in bank profitability in this section. Using our pooled cross-sectional, time-series sample of banks in Lebanon from 1993 to 2000, we estimate regression equations for ROE and ROA models.¹⁹ The total number of banks included in the sample is 484. Table 6 presents the Pearson correlation matrix for the variables used in the regression analysis and a discussion of the variance-inflation factor (VIF) tests used to detect multicollinearity among our regressors.

Our first regression equation attempts to explain the variation in ROE:

$$\begin{aligned} ROE_{it} = & B_0 + B_1(SPREAD)_t + B_2(GDPGROWTH-1) + B_3(TBILLS/EQUITY)_{it} \\ & + B_4(FCDE/EQUITY)_{it} + B_5(LNASSETS)_{it} + B_6(FOREIGN)_{it} \\ & + B_7(EMPLOYEE/EQUITY)_{it} + B_8(OFFBALANCE/EQUITY)_{it} + \varepsilon_{it} \quad (2) \end{aligned}$$

where ROE_{it} is the return on average equity for bank i in year t ; $SPREAD_t$ is the difference in the average month-end interest rate paid on T-bills denominated in Lebanese pounds and the average month-end interest rate paid on deposits in Lebanese pounds in year t ; $GDPGROWTH-1$ is a lagged independent variable which represents the real growth rate in gross domestic product in year $t-1$; $ASSETS_{it}$ is the average total assets for bank i in year t ; $EQUITY_{it}$ is the average total equity for bank i in year t ; $TBILLS_{it}$ is the average investment in treasury bills for bank i in year t ; $FCDE_{it}$ is the average amount of foreign currency deposits for bank i in year t ; $LNASSETS_{it}$ measures the natural log of average assets; $FOREIGN_{it}$ is a dummy variable with a value of 1 when a bank i is at least 50 percent owned by a foreign bank in year t ; $EMPLOYEE_{it}$ is the number of employees for bank i in year t ; $OFFBALANCE_{it}$ is the average balance sheet assets for bank i in year t ; and ε_{it} is the error term.

Table 6. Pearson Correlation Matrix. Coefficients of Correlation among the independent variables used in the regression equation when ROA is used as the dependent variable. The spread between rates on t-bills and rates on deposits in Lebanese pounds (SPREAD); the annual growth in real GDP in the previous year t-1 (GDPGROWTH); Lebanese pound t-bills to total assets (TBILLS/ASSETS); Foreign Currencies Deposits to Total Assets (FCDE/ASSETS); the natural logarithm of total assets (LNASSETS); a dummy variable (FOREIGN) which is equal to zero if the bank is domestically owned and one if it is an affiliate of a foreign bank, the ratio of the number of employees to assets (EMPLOYEE/ASSETS), and the ratio of off balance sheet assets to total assets (OFFBALANCE/ASSETS).

VARIABLE	SPREAD	GDPGROWTH	TBILLS/ ASSETS	FCDE/ ASSETS	LNASSETS	FOREIGN	EMPLOYEE/ ASSETS	OFFBALANCE/ ASSETS
SPREAD	1.0							
GDPGROWTH	0.57 ^b	1.0						
TBILLS / ASSETS	-0.07	0.08	1.0					
FCDE / ASSETS	0.14 ^b	-0.07	-0.34 ^b	1.0				
LNASSETS	-0.32 ^b	-0.26 ^b	0.24 ^b	0.21 ^b	1.0			
FOREIGN	-0.05	-0.05	-0.34 ^b	0.29 ^b	0.06	1.0		
EMPLOYEE / ASSETS	0.43 ^b	0.23 ^b	-0.034	-0.21 ^b	-0.57 ^b	-0.18 ^b	1.0	
OFFBALANCE / ASSETS	0.013	0.065	-0.20 ^b	0.11 ^b	0.097	0.234 ^b	-0.153 ^b	1.0

^a Correlation is significant at the 0.05 level (2-tailed).

^b Correlation is significant at the 0.01 level (2-tailed).

Notes: Since the existence of high pairwise correlations among the independent variables in regression models creates multicollinearity problems, we used the variance-inflation factor (VIF) to test for this adverse effect. VIFs, which measure the effect of multicollinearity on the variances of the regression coefficient estimates, are calculated for each independent variable as $VIF = 1/(1-R^2)$, where R^2 is the coefficient of determination obtained when each of the independent variables is regressed on the remaining independent variables. A large VIF (> 5) caused by a large R^2 indicates multicollinearity. Our results show that none of the VIFs is high enough to cause any concern about multicollinearity.

Table 7
Results for the following OLS regression:

$$\text{Performance}_{it} = B_0 + B_1(X1)_{it} + B_2(X2)_{it} + B_3(X3)_{it} + B_4(X4)_{it} + B_5(X5)_{it} + B_6(X6)_{it} + B_7(X7)_{it} + B_8(X8)_{it} + \varepsilon_{it}$$

Independent Variables	Dependent Variable ROE	t-statistic	Independent Variables	Dependent Variable ROA	t-statistic
Constant	14.61	0.77	Constant	1.57	1.99 ^c
SPREAD	2.18	2.15 ^c	SPREAD	0.03	0.88
GDPGROWTH-1	115.55	1.14	GDPGROWTH-1	8.60	2.25 ^c
TBILLS/EQUITY	2.02	5.25 ^a	TBILLS/ ASSETS	2.51	4.458 ^a
FCDE/EQUITY	1.40	10.53 ^a	FCDE/ASSETS	0.67	1.64 ^d
LNASSETS	-2.07	-1.48	LNASSETS	-0.136	-2.34 ^b
FOREIGN	2.45	0.58	FOREIGN	0.34	2.02 ^c
EMPLOYEE/EQUITY	-831.91	-10.04 ^a	EMPLOYEE/ ASSETS	-722.62	-6.932 ^a
OFFBALANCE / EQUITY	0.87	1.66 ^d	OFFBALANCE/ ASSETS	-0.079	-0.513
Model adjusted R ²	0.463		Model adjusted R ²	0.153	
Model F-Statistic	52.51		Model F-Statistic	12.1	
Model significance level	0.000		Model significance level	0.000	

Sample size = 484

¹ ROE_{it} = the return on average shareholders equity in percent for bank i in year t; ROA_{it} = the return on average total assets in percent for bank i in year t; SPREAD = Spread between rates on t-bills and rates on deposits in Lebanese pounds; GDPGROWTH-1 = annual growth in real GDP in the previous year t-1; TBILLS_{it} = the amount invested in treasury bills for bank i in year t; FCDE_{it} = the amount of foreign currency deposits for bank i in year t; ASSETS_{it} = the average total assets of bank i in year t; FOREIGN_{it} is a dummy variable with a value of 1 when a bank i is at least 50% owned by a foreign bank in year t and zero otherwise; EMPLOYEE_{it} = the number of employees for bank i in year t; OFFBALANCE_{it} = off balance sheet assets for bank i in year t; EQUITY_{it} = the average shareholders' equity for bank i in year t; LNASSETS_{it} = the natural logarithm of the average total assets of bank i in year t;

^a significant at the 0.01 level

^b significant at the 0.02 level

^c significant at the 0.05 level

^d significant at the 0.10 level

We use SPREAD_t and GDPGROWTH-1 to test for the respective effects of interest margin and growth in the economy on bank profitability. We expect both of these variables to be positively related to bank profit. Banks that hold relatively more TBILLS may not be as profitable as banks that invest more heavily in loans or other assets. But in Lebanon, T-bills pay high interest rates compared to those in developed countries. We use FCDE to test for the effects of foreign-currency deposits on bank

profitability. To control for foreign affiliation we use the binary variable, FOREIGN. EMPLOYEE is used to test for labor efficiency while OFFBALANCE is used to test for the effect of investing in off-balance sheets assets on profitability. We employ LNASSETS as a control for bank size.

We also use ROA as a dependent variable. In this regression, average total assets replaces average total equity to scale the independent variables derived from the balance sheet.

Table 7 presents the results for estimating our two regression equations. The first regression equation attempts to explain the variation in return on average total equity, ROE. With the balance-sheet variables standardized by average total equity capital, this equation explains 46.3 percent of the variation in ROE. Five of the eight independent variables have significant effects on ROE. Four of the five variables, SPREAD, TBILLS/EQUITY, FCDE/EQUITY AND OFFBALANCE/EQUITY have significant positive associations with ROE. In contrast and as expected, banks that have more employees (per dollar of equity) have lower ROEs. The coefficients of GDPGROWTH-1 and FOREIGN are not statistically significant in determining ROE.²⁰ The control for bank size (LNASSETS), which has some marginal significance ($t = -1.48$), suggests that bigger banks have lower ROEs.

Our second regression equation attempts to explain the variation in return on average total assets, ROA. Although this equation has lower overall explanatory power than the ROE model (15.3% vs. 46.3%, see Table 7), the expected signs and statistical significance of the regressors are similar across the two equations. Two differences, however, are worth mentioning: (1) the reduced significance of FCDE in the ROA model, where the t -statistic drops from 10.5 to 1.64, and (2) the stronger negative association between bank size and profitability ($t = -2.34$). When we test for the separate effects of SPREAD and GDPGROWTH-1, as described in footnote 20, we find similar results to those reported in the experiments described there.

The relatively low R^2 for the ROA regression based on OLS and the nature of our time-series data suggest that unique differences and cross-sectional variation between banks may play an important role in explaining variations in ROA among banks. To account for this possibility, we estimate a model suggested by Greene (1990). It assumes that differences across banks can be captured by differences in the constant term by using a "fixed-effects model". This estimation procedure includes a dummy variable for each bank while dropping the traditional constant term from the equation. For this version of the ROA model, the dummy variable for affiliation with a foreign bank was not included. The regression equation is:

$$\begin{aligned} \text{ROA}_{it} = & B_1(\text{SPREAD})_t + B_2(\text{GDPGROWTH-1})_t + B_3(\text{TBILLS/ASSETS})_{it} \\ & + B_4(\text{FCDE/ASSETS})_{it} + B_5(\text{LNASSETS})_{it} + B_6(\text{FOREIGN})_{it} \\ & + B_7(\text{EMPLOYEE/ASSETS})_{it} + B_8(\text{OFFBALANCE/ASSETS})_{it} \\ & + \text{COEFFICIENTS AND DUMMY VARIABLES FOR EACH BANK} + \varepsilon_{it} \end{aligned} \quad (3)$$

Table 8
Fixed-effects model for ROA

MODEL*				
$ROA_{it} = B_1(SPREAD)_{it} + B_2(GDPGROWTH-1)_{it} + B_3(TBILLS/ASSETS)_{it} + B_4(FCDE/ASSETS)_{it} + B_5(LNASSETS)_{it} + B_6(EMPLOYEE/ASSETS)_{it} + B_7(OFFBALANCE/ASSETS)_{it} + \text{COEFFICIENTS AND DUMMY VARIABLES FOR EACH BANK} + \varepsilon_{it}$				
$ROA_{it} =$	-0.018	(-0.50)	$+10.53$	$(3.06)^a$
			$+1.33$	$(1.73)^b$
			$+0.018$	(0.32)
			$+0.05$	(0.63)
			-129.89	(-0.97)
			$+0.10$	(0.67)

Sample size = 484 pooled, cross-sectional observations, 1993-2000

Model Adjusted $R^2 = 0.57$

Model F-Statistic = 9.4

Model Significance Level = 0.0001

Figures in parentheses are t-statistics.

^a Significant at 0.01 level

^b Significant at 0.10 level

* ROA_{it} = the return on average total assets in percent for bank i in year t ; $SPREAD_t$ = Spread Between Rates on Treasury Bills and Rates on Deposits in Lebanese Pounds in year t ; $GDPGROWTH-1$ = annual growth in real GDP in the previous year $t-1$; $(TBILLS/ASSETS)_{it}$ = the amount invested in treasury bills divided by average total assets for bank i in year t ; $(FCDE/ASSETS)_{it}$ = the average amount of foreign currency deposits divided by average total assets for bank i in year t ; $LNASSETS_{it}$ = the natural logarithm of the average total assets of bank i in year t ; $(EMPLOYEE/ASSETS)_{it}$ = the ratio of the number of employees to average total assets in millions of Lebanese pounds for bank i in year t ; $(OFFBALANCE/ASSETS)_{it}$ = the ratio of off balance sheet assets to average total assets for bank i in year t .

Table 8 shows the estimates for the fixed-effects model, which explains 57 percent of the variation in ROA. Although the estimated coefficients for the 70 banks dummy variables are not shown (for practical reasons), the important point is whether they differ across banks.²¹ The null hypothesis is that the coefficients of the dummy variables are zero, which is rejected at the one-percent level of significance. Aside from the significant effects of the bank dummy variables, GDP growth (1% level of significance) and t-bills per dollar of assets (10% level of significance) are the only other significant variables in the fixed-effects model. On balance, the results suggest that cross-sectional variation among banks play a major role in explaining ROA.

I. Discussion

Given the statistical significance of our univariate findings and regression estimates, what can we say about our results from a financial/economic perspective? First, banks in Lebanon are profitable, although not as profitable as banks in other Arab Gulf countries, and appear to be much safer than they were at the start of our sample period,

but not as safe as our control banks that benefit from petrodollar economies. In general, the cessation of war, reduced inflation, and the worldwide focus on bank capital adequacy are clear reasons for an improved banking environment in Lebanon. Specifically, our models show a strong association between economic growth (or spread management) and bank profitability, whether measured by ROE or ROA. From a bank financial-management perspective, it seems that investing in Lebanese t-bills has a positive association with bank profitability. Rather than gather deposits and mainly make (nongovernment) loans, the traditional banking function, Lebanese banks gather deposits but come up a bit short on the lending side as they invest heavily in t-bills. This portfolio strategy is not irrational, of course, as Lebanese t-bills offer high returns. It comes at a potentially high social cost, however, as loans to the private sector should provide a greater stimulus for economic growth. The basic function of financial intermediaries – to channel savings into productive investments – is being circumvented in Lebanon. If the low loan-to-asset ratios found in Lebanese banks can be increased through productive lending, this improvement would help jump-start the sluggish Lebanese economy.

VI. SUMMARY AND CONCLUSIONS

At the end of the civil war in Lebanon (1990), Charbaji, Mikdashi, and Chebaro (1994) describe Lebanese banks as having “suffered a severe decline in activity and profitability and dissolution of financial capital” (p. 86). Since then, we find bank profitability and capital are quite strong in Lebanon but not as strong as a control group of banks from five other Arab Gulf countries. However, in terms of better performing the traditional bank intermediation function, Lebanese banks have considerable room for improvement. This finding provides our main policy implication for the banking sector in Lebanon: Quite simply, do what banks are supposed to do and make more loans, which will stimulate the economy and promote economic growth. A related policy recommendation is for Banque du Liban, the central bank, to discontinue offering high returns on t-bills, which provides a major disincentive for banks not to engage in lending to the private sector. On balance, if banks in emerging markets do not do their jobs, they restrict the ability of their countries to grow and their markets to develop more fully.

NOTES

1. This section draws on Charbaji (2001), Shehadi and Schneider-Sickert (1998), and Schneider-Sickert and Iskandar (1998).
2. During July 1997, the US lifted its travel ban on its citizens traveling to Lebanon. Prior to that de facto entry was achieved by entering Lebanon with a visa separate from one's passport. The events of September 11, 2001 have renewed concerns about safe travel around the world.
3. The total value of tourism was estimated to be about the equivalent of US\$600 million for 1993. By year-end 1998, however, the figure had more than doubled to

US\$1.3 billion. From 1993 through 1998, the number of visitors to Lebanon and tourism revenues have grown at annual rates of 24% and 21%, respectively. See Ladki, et al. [2001].

4. About 12 million people of Lebanese origin live elsewhere in the world, most of them in economies more prosperous than Lebanon. The Ministry of Finance estimated the amount of remittances at the equivalent of US\$939 million in 1996, but this figure is quite unreliable. Errors and omissions in the Ministry of Finance data amounted to over US\$4 billion in their reconciliation of the balance of payments.
5. Approximately 90 percent of loans made by Lebanese banks are denominated in US dollars. Lebanese banks tend to follow a practice of using the money they receive in Lebanese pound deposits to invest in Lebanese treasury bills, and using the money they receive in US dollar deposits to make US dollar loans.
6. The average interest rate on US dollar denominated loans and deposits were not available for 1993 and 1994.
7. One aspect of capital-structure regulation in Lebanon is that even the smallest banks must have at least 10 billion Lebanese pounds in shareholders' equity, a substantial constraint for small banks. However, although all banks are subject to BIS capital-structure rules, they tend to be more binding for larger banks.
8. Bilanbanques is published annually by Bank Data Financial Services in collaboration with the Association of Banks in Lebanon and is sponsored by Banque du Credit Libanais. Each issue of Bilanbanques reports data for the two years immediately preceding the issuance year.
9. As of 2001, the Ministry of Finance requires all Lebanese banks to follow International Accepted Accounting Standards. Before this, most banks were preparing financial statements according to US Generally Accepted Accounting Principles. The Banking Control Commission of the Lebanese Central Bank supervises closely the activities and operations of Lebanese banks according to strict rules and regulations. Lebanese banks are highly regulated. Financial statements of Lebanese commercial banks are audited by major accounting firms (e.g., Deloitte and Touche and Price Waterhouse Coopers).
10. The number of banks varied between 1993 and 2000 because some banks started operations during this period while other banks disappeared because of insolvencies and mergers.
11. In their theoretical exposition, Hannan and Hanweck used expected ROA. We employ average ROA over a number of years as a proxy for expected ROA.
12. Although we specifically test the relationship between bank profitability and size, we do not test for economies of scale.
13. Awkward foreclosure laws in Lebanon as well as a lack of liquidity in residential real-estate markets also make mortgage lending an unattractive investment for Lebanese banks.
14. This standard is based mainly on the US experience, excluding the ten largest banks. For example, during the 1980s a bank that did one percent or better on assets was a high-performance bank. After the early 1990s, banks that were not

doing at least one percent on assets were underperforming. For example, see Bassett and Zakrejsek [2000].

15. The simultaneous increase in ROA and decrease in ROE were due to large increases in the ratio of shareholders equity to total assets for most banks. Banque du Liban put pressure on banks to increase equity capital and introduced capital-structure rules on banks during this period.
16. Our risk indices in Table 3 are calculated as “typical”, as described by Eisenbeis and Kwast [1992], which means that they are based on cross-sectional estimates of the components of the risk index. Since Blasko & Sinkey [2004] show that RIs based on individual bank, time-series standard deviations of ROA produce different results, we also employ their method of calculation. The findings, however, are not qualitatively different in this case (Table 3). On balance, bank safety in Lebanon has improved over our test period.
17. At the end of 2000, the largest bank was Banque du Liban et d'Outre-Mer with total assets of 8,736 billion Lebanese pounds (\$5.8 billion) while the smallest bank was Rafidain Bank with total assets of 15 billion Lebanese pounds (\$10 million).
18. A three-page table of these finding is available from the authors.
19. We acknowledge that pooling the observations across years introduces some dependence in the error terms of the model because the same firms are represented multiple times.
20. Although VIF estimates (see the notes to Table 6) indicate that multicollinearity is not a problem, we still are concerned about the high pairwise correlation (0.57) between SPREAD and GDPGROWTH-1. Therefore, we reestimated the ROE regression without SPREAD and find that GDPGROWTH-1 has the expected positive sign and is statistically significant ($t = 2.76$). When we exclude GDPGROWTH-1, the t -statistic on spread increases to 3.3 from 2.15. Thus, when both variables are included in the ROE regression, their separate effects become blurred. The estimated relationships of the other variables showed only minor difference in these experiments.
21. In the F-test, the unrestricted model is the fixed-effects model while the restricted model is a pooled model with a single constant term.

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APPENDIX A

This appendix shows ROE, ROA, and derived relations from these data from 1995 to 1999 by country for our control group of 52 banks from five Arab Gulf Countries. The group contains all the banks in these countries and the data are the only available information that we could find.

	Country	UAE	Saudi Arabia	Kuwait	Bahrain	Oman
Year	Performance	N= 18	N= 10	N= 8	N= 9	N= 7
1995	ROA %	1.84	1.38	1.16	1.82	1.95
	ROE %	11.0	14.0	8.73	8.30	18.89
1996	ROA %	2.66	1.43	1.54	2.07	1.82
	ROE %	14.98	13.39	11.27	9.87	17.80
1997	ROA %	2.78	1.41	1.79	2.56	2.09
	ROE %	16.14	14.13	12.63	13.65	18.52
1998	ROA %	2.56	1.52	1.40	1.68	1.96
	ROE %	14.37	15.14	8.94	10.27	15.48
1999	ROA %	2.48	1.41	1.54	1.99	1.64
	ROE %	13.27	13.73	9.66	11.98	12.89
MEANS	ROA %	2.46	1.43	1.49	2.02	1.89
	ROE %	13.96	14.06	10.24	10.82	16.72
Standard Deviation	ROA %	0.37	0.05	0.23	0.33	0.17
Capital Ratio(%)	Inverse of ROE / ROA	17.65	10.17	14.51	18.71	11.32
Risk Index	Eisenbeis & Kwast	54.90	217.30	69.50	61.80	77.60
Solvency	P(BVE) < 0 %	0.0166	0.0010	0.0103	0.0131	0.0083

Notes: P(BVE) < 0 stands for the probability of book value of equity less than zero. It equals the reciprocal of $2(RI)^2$, where RI = risk index. See Table 3 for additional notes.

Source: See Table 4.

