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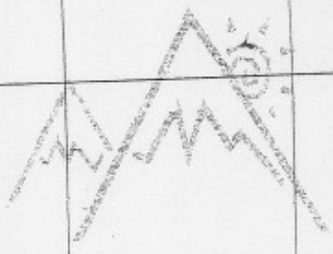

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The Determinants of Bank Profitability of a Petroleum Economy: the Case of Saudi Arabia*

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Measured in terms of return on equity and return on total assets, Saudi commercial banks continue to generate some of the highest returns found among the financial institutions in the Gulf Cooperation Council (GCC) region and developed world. (*Middle East Economics Digest 2002*, p. 5). Third quarter 2003 results for nine of the ten Saudi banks, showed an average return on assets of 1.6% and return on equity of 13.93%, slightly lower than comparable data for the year 2001 which stood at 1.74% and 14.45%, respectively. (National Commercial Bank 2002).

Several factors could affect this long-term profitability. First, a decision by the GCC would allow their national banks to open branches and offer full banking services in the six member states (Saudi Arabia, UAE, Bahrain, Kuwait, Qatar, and Oman). The second factor is the Saudi government's intention to join the World Trade Organization (WTO) with ongoing accession talks. Full accession would open the Saudi market to foreign bank competition and the potential erosion of current profitability levels. However, enhanced competition whether from the GCC-based banks or foreign banks would benefit domestic Saudi borrowers and investors, without reducing Saudi banks efficiency. Demirguc-Kunt and Huzinga (1999) emphasize this aspect by pointing out that policy makers have an interest in promoting banking sectors that are both stable and efficient. Stability requires sufficient banking profitability, while economic efficiency requires banking spreads that are not

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too large. A prerequisite to formulating effective banking polices is to understand the determinants of bank profitability.

The third factor is a possible shift in government policies allowing non-banking corporations to offer closed-end funds, launch different lines of insurance, and/or participate in the public auctioning process of government securities. The fourth factor that might have relevance to bank profitability is concentration. In a previously published work, Essayyad and Madani (2003) found evidence that Saudi banks had high concentration ratios ranging from 0.69 to 0.87 and a Hirshman-Herfindahl Index (HHI) of above 1800, which the U.S. Department of Justice and Federal Trade Commission's *Horizontal Merger Guidelines* considers "highly concentrated." At the regional level, Saudi banks' concentration ratios were higher than those of Egypt and Morocco, but lower than Jordan. Globally, Saudi banks were more concentrated than many developed countries with the exception of Denmark, Finland, the Netherlands, and New Zealand. According to Essayyad and Madani (2003), the positive correlation found between efficiency (measured by interest rate spread) and concentration measures may corroborate the hypothesis that a high concentration may be associated with loan overpricing (and higher profitability) than under more competitive market conditions.

Overview on Saudi Banking Sector

The modern Saudi banking sector is relatively new, with the first local bank established in 1954 and the de facto central bank—the Saudi Arabian Monetary Agency (SAMA)—established two years earlier in 1952. Paper currency, the Saudi riyal, became the fiat currency only in 1961, and Saudi majority ownership of local foreign bank branches (the Saudization process) was completed in 1982. Under this process, the maximum foreign ownership was set at 40% and, by all indicators, it has been a profitable relationship between the foreign and Saudi partners (see Al-Dukheel, 1995). The number of banks have now been reduced to ten from the previous 12 with the mergers first of Saudi Cairo and United Saudi Commercial Banks, and then these with the Saudi American Bank in 1999. Nine of the Saudi Banks (Saudi American, Saudi Fransi, Saudi British, Saudi Hollandi, Al Jazira, Saudi Investment Bank, Riyad Bank, Arab National Bank, and Al Rajhi) are listed on the Saudi stock market, while the largest Saudi bank—the National Commercial Bank—is not listed and is currently owned 80% by the government and the remaining 20% by private families. The government also owns 38% of Riyad Bank. Of the "Saudized" banks, only Saudi British Bank and Saudi Hollandi Bank still retain the original 40% foreign ownership through British Bank of Middle East/HSBC and ABN-AMRO respectively; the remainder have sold part of their share to Saudi interests (Saudi American Bank, Al Jazira Bank, Saudi Investment Bank) or been diluted through capital increases (Saudi Fransi).

According to SAMA (December 2002), the consolidated assets of the Saudi bank balance sheet was SR 508.2 billion ($135.5 billion) of which claims on the government were $36 billion, most of which were in the form of government development bonds, ranging from one to ten year maturities, and paying a premium over comparable U.S. bonds. Foreign assets to total assets were 18.7%, as of December 2002.

In terms of regulating the Saudi banking sector, SAMA follows most of the traditional regulatory mechanisms applied in developing countries with the exception of a formal deposit insurance scheme and formal restrictions on bank holding/ownership or competition. Table 1 below summarizes the highlights of current SAMA banking regulations.

Table 1
Saudi Banking Regulation Check List

Policy Tools	Available	Not Available	Type of Control
Government safety net	X		No deposit insurance scheme exists
Restriction on bank holdings	X		No restrictions. Large concentration of ownership in few hands
Capital requirements		X	BASLE BIS capital adequacy ratios applied
Disclosure requirements		X	Large loans need clearance; reports submitted to SAMA
Consumer protection		X	Maximum changes (SAMA rates) applied on commissions
Restriction on composition	X		No formal policy of restriction as to branch network, nor in type of business

Source: Saudi Arabian Monetary Agency, Annual Reports 2001 and 2002, Riyadh, Saudi Arabia

Since the Saudization policy of selling 60% to the Saudi public and given the lack of restriction on bank holdings, there has been a large degree of concentration in fewer hands over the years. Today, the most extreme concentration of ownership example is Saudi Hollandi Bank with 600 shareholders owning the 60% Saudi share (Al-Dukheel, 2002).

The Saudi banks are well capitalized in comparison to their counterparts in Europe and the US, and, in terms of the minimum, risk-weighted, capital-to-assets ratio requirement of 8%, stipulated by the Basle Agreement. The average risk-weighted capital ratio for the Saudi banks was 18.7%, representing a slight fall over the 20.3% for 2001, but still more than double the Basle Agreement's requirement. Statutory deposits held as reserves with SAMA, averaged at 4.5% for the Saudi banks and have been within the range of 4.1- 4.5% for the past few years. (*SAMA Annual Report,*2002).

This significant Saudi bank capitalization presupposes that Saudi banks will have a higher return on assets but a lower return on equity. SAMA's supervisory style has tended to err on the conservative side, and there are economic benefits in having well capitalized banks. Such banks face lower expected bankruptcy costs for themselves and their customers thus reducing the cost of funding. (Demirguc-Kunt and Huzinga, 1999).

The lack of SAMA restrictions on bank competition or on the range of products and services Saudi banks can offer (with the exception of mortgage lending) has ensured that Saudi banks function in a financial framework that is different from many other developed or developing countries (Essayyad and Madani, 2003). They provide both commercial and investment banking, Shariah (Islamic) compatible products, security brokerage, and mutual funds.

The Saudi government has passed a new capital market law (*Arab News*, December 2002) to liberalize existing regulations and establish trading of shares through an independently supervised stock exchange and with trading through brokerage houses instead of only through banks. The implementation of this new legislation will deprive Saudi banks of their share-trading brokerage fees amounting to 1% of the value of trades, but until then the Saudi banks will still be in a privileged position to manage the expected privatization announced by Saudi Arabia in November 2002, which encompassed 20 vital sectors ranging from utilities, refineries, and hospitals to sport clubs. The first major partial privatization carried out was the sale of 90 million government shares in Saudi Telecommunication Company (STC), which was granted to Gulf International Bank (GIB) to act as sole financial advisor (*Arab News*, December 2002). GIB was the first GCC bank to be granted a license in Saudi

Arabia, and this mandate indicated that the new GCC bank's entrants to the Saudi market, including Kuwait-based National Bank of Kuwait, and Dubai-based Emirates International Bank—all of whom have extensive investment banking experience—will compete aggressively for other privatization mandates.

Literature Review

A review of literature reveals that many researchers have explicitly studied the determinants of commercial bank profitability [Berger (1995), Haslem (1968), Short (1979), Bourke (1989), Molynex and Thornoton (1992), Lee (1981), Lin (1985), Shanmugan (1998), Pang (1995), and Haron (1996)]. The main focus of these studies has been the debate between the structure-conduct-performance theory and the efficient-structure hypothesis.

The structure-conduct-performance theory, according to Berger (1995) and Niu (2000), asserts that the level of concentration and resulting market power are the main determinants of bank profitability. This theory links concentration to profitability, i.e., more concentrated industries or firms are able to charge higher prices and thus enjoy higher profits. It also argues that concentration facilitates collusion and leads to price fixing at a non-competitive level.

Bergen (1995) and Niu (2000) maintain that more efficient firms are likely to have both high market share and high profitability, even in the absence of market power. This efficient-structure-hypothesis is exemplified by Smirlock (1985) who links efficiency to market structure and argues that there is a positive relationship between the efficiency of a firm and its market share. The proponents of this hypothesis argue that an observed positive relationship between measures of market share and profits may be due to superior efficiency rather than market power.

While the scope of Essayyad and Madani's paper (2003) was restricted to bank structure and market power in Saudi Arabia, this paper investigates the other determinants of bank profitability in that country. It is interesting to note that Essayyad and Madani's (2003) findings on Saudi banks are similar to those reported by Cruickshank (2000) which offered some evidence of excess profitability of United Kingdom banks.

Methodology and Data

In most studies on banks profitability, researchers used simple accounting rates of return as the independent variable. Based on this understanding and following the work of other researchers including Demirguc-Kunt and Huizinga (1995), bank's profitability is measured by the following ratios:

(1) $P = BTP/TA$ or BTP/E

Where "P" is bank's profitability, "BTP" is bank before-tax profit, "TA" is bank's total assets, and "E" is bank's equity. Demirguc-Kunt and Huizinga (1999) showed that differences in interest margins and bank profitability reflect a variety of determinants: bank characteristics (size, leverage, type of business, and foreign or domestic ownership), macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and underlying legal and institutional indicators. Due to data limitation, the authors of this study were constrained by inaccessibility to data on legal and institutional indicators of type of business. The government has been striving to improve disclosure and transparency, but for now, the data problem can't be ignored. By contrast, Nier (2000) used risk-adjusted measures of profitability (both the CAPM framework and Tobin's q ratio) as the dependent variables.

Six multiple regression models measure the degree of association between a bank's profitability and the following factors: bank characteristics, market power, macroeconomic environment, financial structure, private/public lending, and the impact of oil sector. The theoretical economic rationalization of the inclusion of the independent variables in the respective models is articulated in the next section, which presents and discusses the empirical results.

Profitability and Bank Characteristics

The following first regression model investigates profitability and bank characteristics:

(2) $Y_{it} = \Psi_{i0} + \Psi_{i1}(F_{it1}) + \Psi_{i2}(F_{it2}) + \Psi_{i3}(F_{it3}) + \Psi_{i4}(F_{it4}) + \Psi_{i5}(F_{it5}) + E_{it}$

Where Y_{it} is profitability of the i[th] bank in year t as measured in equation (1) by dividing the bank before-tax profit by its total assets. F_{it1} is equity/total assets ratio for the i[th] bank in year t , F_{it2} is loan/total assets ratio for the bank in year t, F_{it3} is non-interest earnings assets/total assets ratio of the bank in year t, F_{it4} is overhead/total assets ratio for the ith bank in year t, and F_{it5} is foreign ownership/total assets ratio for the ith bank in year t. Ψ_{i0}, Ψ_{i1}, Ψ_{i2}, Ψ_{i3}, Ψ_{i4}, and Ψ_{i5} are regression coefficient. E_{it} is the residuals term whose expected value is zero.

Profitability and Market Power

The following regression model investigates profitability and bank market power:

(3) $Y_{it} = \Psi_{t0} + \Psi_{1}(F_{t1}) + \Psi_{2}(F_{t2}) + \Psi_{3}(F_{t3}) + \Psi_{4}(F_{t4}) + E_{it}$

Unlike other models, in this model Y_{it} denotes the total profitability of all banks in year t as measured in equation (1) by dividing the bank before-tax profit by its total assets, is Hirshman-Herfindahl Index (HHI) in year t. This index is measured by taking the sum of the squares of individual bank's loans or deposits. Mathematically, it is expressed as follows:

$$(4)\ \text{HHI} = \sum_{i=1}^{n}\left[\left\{ Pi \Big/ \sum_{i=1}^{n} Pi \right\}^2\right]$$

The US Department of Justice and Federal Trade Commission's *Horizontal Merger Guidelines* consider markets with an HHI above 1800 as "highly concentrated." The Department of Justice utilizes this measure as a tool to enforce its anti-trust laws. F_{t2} is three-bank deposit concentration measure in year t, F_{t3} is number of banks as proxy of market power in year t, and F_{t4} is total banks assets as proxy of market power in year t. Ψ_{0}, Ψ_{1}, Ψ_{2}, Ψ_{3}, and $\Psi_{4}$are regression coefficients, and E_t is the residuals term whose expected value is zero.

Profitability and Macroeconomic Indicators

The following regression model investigates profitability and macroeconomic indicators:

(4) $\Psi_{it} + \Psi_{i1}(F_{it1}) + \Psi_{i2}(F_{it2}) + \Psi_{i3}(F_{it3}) + \Psi_{i4}(F_{it4}) + E_{it}$

Where Y_{it} is profitability of the i[th] bank in year t as measured in equation (1) by dividing the bank before-tax profit by its total assets, F_{it1} is gross domestic product per capita in year t , F_{it2} is inflation rate in year t, F_{it3} is short term interest rate in year t, and F_{it4} is budget/GDP ratio in year t. Ψ_{i0}, Ψ_{i1} , Ψ_{i2}, Ψ_{i3}, and Ψ_{i4} are regression coefficients, and E_{it} is the residuals term whose expected value is zero.

Profitability and Financial Structure

The following regression model investigates profitability and financial structure:

$$(5)\quad Y_{it} = \Psi_{it0} + \Psi_{i1}(F_{it1}) + \Psi_{i2}(F_{it2}) + \Psi_{i3}(F_{it3})\, E_{it}$$

Where Y_{it} is profitability of the i[th] bank in year t as measured above by equation (1) by dividing the bank before-tax profit by its total assets, F_{it1} is assets/GDP ratio for the ith bank in year t , F_{it2} is stock market capitalization/ GDP ratio in year t, and F_{it3} is stock market capitalization/total assets of all banks ratio in year t. Ψ_{i0}, Ψ_{i1}, Ψ_{i2}, and Ψ_{i3} are regression coefficients, and E_{it} is the residuals term whose expected value is zero.

Profitability and Lending (Public Versus Private)

The following regression model investigates the relationship between profitability and private versus public lending:

$$(6)\quad Y_{it} + \Psi_{it0} + \Psi_{i1}(F_{it1}) + \Psi_{i2}(F_{it2}) + E_{it}$$

Where Y_{it} is profitability of the i[th] bank in year t as measured by equation (1) by dividing the bank before-tax profit by its total assets, F_{it1} is bank's claims on private sector in year t, and F_{it2} is bank's claims on public sector in year t. Ψ_{i0}, Ψ_{i1}, and Ψ_{i2} are regression coefficients, and E_{it} is the residuals term whose expected value is zero.

Profitability and the Impact of Oil Sector

The following regression model investigates profitability and the impact of oil sector:

$$(7)\quad Y_{it} + \Psi_{it0} + \Psi_{i1}(F_{it1}) + \Psi_{i2}(F_{it2}) + \Psi_{i3}(F_{it3}) + \Psi_{i4}(F_{it4}) + E_{it}$$

Where Y_{it} is profitability of the i[th] bank in year t as measured by equation (1) by dividing the bank before-tax profit by its total assets, F_{it1} is oil proven reserve in year t, F_{it2} is average oil prices in year t, F_{it3} is oil export/total export ratio of the country in year t, and F_{it4} is oil export/GDP ratio in year t. Ψ_{i0}, Ψ_{i1}, Ψ_{i2}, Ψ_{i3}, and Ψ_{i4} are regression coefficients, and E_{it} is the residuals term whose expected value is zero.

Data

This paper uses the annual financial statements (income statements and balance sheets) of the ten Saudi commercial banks (see Table 2) for the years 1989-2002. Other relevant data is obtained from the Saudi Arabian Monetary Agency (SAMA) and the Statistics Department of the Saudi Ministry of Planning.

Table 2
Saudi Banks

Al-Jazira Bank	Al-Rajhi Bank
National Commercial Bank	Riyad Bank
Arab National Bank	The Saudi American Bank
The Saudi British Bank	The Saudi Fransi Bank
The Saudi Hollandi Bank	The Saudi Investment Bank

Empirical Results and Analysis

The regression results are presented in Tables 3-7. Table 3 shows the relationship between profitability and bank characteristics. The impact of market power on bank profitability is presented and discussed below. Table 4 presents the estimated coefficients for macroeconomic indicators, Table 5 contains the regression results related to the impact of bank financial structure, Table 6 shows the impact of the distinction between lending to public and private sectors, and Table 7 presents the results pertaining to the impact of oil variables on bank profitability.

Profitability and Bank Characteristics

Table 3 shows the relationships between bank profitability and bank characteristics expressed in terms of asset size: equity/total assets (capitalization characteristics), loans/total assets, overhead/total assets, and the percentage of foreign ownership/total assets. We also lag equity, loans, overhead, foreign ownership, and assets by one period.

Banks in many countries show a positive relationship between bank profitability and capitalization (Demirguc-Kunt and Huizinga, 1999). Berger's (1995b) empirical findings indicate US banks also have a positive relationship. Some argue that well-capitalized banks contribute to a lower expected cost of funding (deposit), pushing net profits higher.

Table 3
Repression Results on Profitability and Bank Characteristics

(2) $Y_{it} = \Psi_{i0} + \Psi_{i1}(F_{it1}) + \Psi_{i2}(F_{it2}) + \Psi_{i3}(F_{it3}) + \Psi_{i4}(F_{it4}) + \Psi_{i5}(F_{it5}) + E_{it}$

Where Y_{it} is profitability of the i[th] bank in year t as measured in equation (1) by dividing the bank before-tax profit by total assets. F_{it1} is equity/total assetsratio for the i[th] bank in year t, F_{it2} is loan/total assetsratio for the bank in year t, F_{it3} is non-interest earnings assets/total assetsratio of the bank in year t, F_{it4} is overhead/total assetsratio for the ith bank in year t, and F_{it5} is foreign ownership/total assetsratio for the ith bank in year t.

	American Bank				Arab Bank				British Bank			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.73		0.59		0.68		0.71		0.61		0.55	
Equity/TA	0.03*	1.74	0.045*	1.89	0.24**	1.98	0.28*	1.79	0.14**	2.03	0.29**	1.90
Loans/TA	0.66**	2.22	0.57**	1.97	0.21	1.35	0.41**	2.19	0.02	1.21	0.44**	1.98
Non-interest Earning Assets/TA	-0.15*	-1.83	-0.26*	-1.66	-0.36*	-1.88	-0.65**	-1.95	-0.02*	-1.66	-0.026	-0.79
Overhead/TA	-0.37*	-1.77	-0.07**	-1.95	-0.12	-1.312	-0.87**	-2.02	-0.32*	-1.79	-0.66***	-2.52
Foreign Ownership/TA	0.09**	2.33	0.081**	2.411	0.02	1.23	0.11	1.56	0.25	1.84**	0.63	3.298***

* significant at the 10 percent level. ** significant at the 5 percent level. *** significant at the 1 percent level.

Table 3 (continued)

	Fransi Bank				Hollandi Bank				Investment Bank			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.77		0.84		0.49		0.66		0.58		0.61	
Equity/TA	0.22*	1.74	0.11**	2.12	0.54**	2.26	0.19**	2.02	0.24**	1.98	0.38**	2.19
Loans/TA	0.34***	2.45	0.35**	1.96	0.13*	1.76	0.17*	1.69	0.21**	2.28	0.19*	1.80
Non-interest Earning Assets/TA	-0.21***	-3.47	-0.17**	-2.11	-0.19*	-1.74	-0.23*	-1.88	-0.29**	-2.33	-0.27**	-1.99
Overhead/TA	-0.09**	-2.01	-0.03*	1.76	0.06	1.54	0.09*	1.61	0.34**	2.29	0.42*	1.71
Foreign Ownership/TA	0.58**	2.25	0.24*	1.88	0.16*	1.83	0.22	1.89	0.01	0.56	0.04	0.33

* significant at the 10 percent level. ** significant at the 5 percent level. *** significant at the 1 percent level.

Table 3 (continued)

	Al-Jazirah Bank				National Bank				Rajhi Bank			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.71		0.63		0.69		0.52		0.43		0.33	
Equity/TA	0.33**	1.96	0.17**	1.95	0.26**	2.15	0.19*	1.78	0.10*	2.11	0.25***	2.34
Loans/TA	0.28*	1.88	0.38**	2.23	0.16***	3.22	0.18***	3.29	N/A	N/A	N/A	N/A
Non-interest Earning Assets/TA	-0.19*	-1.85	-0.13	-1.44	-0.15*	-1.9	-0.23	-0.73	-0.66***	3.33	-0.39**	2.19
Overhead/TA	-0.34	-1.98	-0.24**	-2.32	-0.48***	-3.36	-0.03	-1.16	-0.09*	-1.67	0.11	1.13
Foreign Ownership/TA	0.00	0.00	0.02	0.22	0.05	0.33	0.14	0.29	0.12	0.13	0.00	0.00

	Riyad Bank			
	Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat
Model R Square	0.68		0.52	
Equity/TA	0.35**	1.97	0.14**	2.13
Loans/TA	0.27*	1.88	0.11*	1.72
Non-interest Earning Assets/TA	-0.15*	-1.66	-0.12**	-1.96
Overhead/TA	-0.81***	3.59	-0.71**	2.11
Foreign Ownership/TA	0.00	0.00	0.02	0.30

* significant at the 10 percent level. ** significant at the 5 percent level. *** significant at the 1 percent level.

Table 4
Regression Results on Bank Profitability and Macroeconomic Indicators

(4) $Y_{it} = \Psi_{it0} + \Psi_{i1}(F_{it1}) + \Psi_{i2}(F_{it2}) + \Psi_{i3}(F_{it3}) + \Psi_{i4}(F_{it4}) + E_{it}$

Where Y_{it} is profitability of the i[th] bank in year t as measured in equation (1) by dividing the bank before-tax profit by its total assets, F_{it1} is gross domestic product per capita in year *t*, F_{it2} is inflation rate in year *t*, F_{it3} is short term interest rate in year *t*, and F_{it4} is budget/GDPratio in year *t*.

	American Bank				Arab Bank				British Bank			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.25		0.50		0.57		0.41		0.37		0.31	
Per Capita GDP	0.002	1.36	0.004	0.94	0.011**	2.83	0.001	1.13	0.023	0.57	0.071	0.36
Inflation	-0.011**	-2.01	-0.003*	-1.68	-0.007**	-2.66	-0.033	-0.94	-0.04*	1.78	-0.23	-1.97
Short-term Interest Rate	-0.05	-0.039	0.001	1.314	0.002**	2.76	0.001**	2.486	-0.034	-0.721	0.27	0.541
Budget/GDP	0	-0.802	-0.023	-0.43	-0.001**	-2.787	-0.0324	-1.917	0.002	0.49	0.007	0.95

	Fransi Bank				Hollandi Bank				Investment Bank			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.14		0.27		0.52		0.39		0.36		0.70	
Per Capita GDP	0.009	0.755	0.001	0.034	0.008	1.49	-0.002	-0.71	-0.03	-1.485	-0.004	-1.041
Inflation	-0.005	-0.078	-0.023	-0.802	-0.060	-1.68	-0.01	-1.96	0.011*	2.119	0.00**	2.326
Short-term Interest Rate	0.025	0.387	0.11	0.709	0.002***	3.255	0.001	1.649	-0.001	-1.082	-0.002**	-2.481
Budget/GDP	0	0.353	0.002	1.188	0.004	0.127	0.0031	1.216	0.001	1.749	0.001**	2.826

Table 4 (continued)

	Al-Jazerah Bank				National Bank				Rajhi Bank			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.45		0.48		0.62		0.78		0.98		0.69	
Per Capita GDP	0.007	0.681	-0.001*	-1.726	0.001	-0.934	-0.005***	-3.51	-0.009***	-8.30	0.003	0.761
Inflation	0.003	-1.135	-0.002	-1.357	-0.022	-1.454	-0.22**	-3.21	0.001**	-2.387	-0.001	-0.493
Short-term Interest Rate	0.03	1.821	0.007	1.207	0.001	0.662	0.002	0.072	-0.002*	-2.818	0.0001	0.004
Budget/GDP	-0.001	-0.152	0.005	1.868	0.003	1.514	0.004***	3.083	0.002***	8.236	-0.003	-0.868

	Riyad Bank			
	Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat
Model R Square	0.34		0.56	
Per Capita GDP	0.0343	-0.249	-0.065	-1.436
Inflation	-0.0082	-1.271	-0.044**	-2.33
Short-term Interest Rate	0.0004	0.092	-0.0003	-0.307
Budget/GDP	0.0071	1.555	0.001**	2.512

*Significant at the 10 percent level. ** Significant at the 5 percent level. *** Significant at the 1 percent level.

Table 5
Regression Results on Bank Profitability and Financial Structure

(5) $Y_{it} = \Psi_{it\,0} + \Psi_{i\,1}(F_{it1}) + \Psi_{i2}(F_{it2}) + \Psi_{i3}(F_{it3})\,E_{it}$

Where Y_{it} is profitability of the i[th] bank in year t as measured above by equation (1) by dividing the bank before-tax profit by its total assets, F_{it1} is bank assets/GDPratio for the ith bank in year t, F_{it2} is stock market capitalization/total bank assets of all banks in year t.

	American Bank				Arab Bank				British Bank			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.17		0.66		0.77		0.66		0.73		0.63	
Bank Assets/GDP	0.022	0.273	-0.068	-1.225	-0.058	-1.581	-0.017	-0.387	-0.046*	-1.79	0.037	1.262
Stock MKT Cap./ GDP	-0.09	-0.526	0.087	0.739	0.084	1.058	0.07	0.73	0.094*	1.717	-0.106*	-1.691
Stock MKT Cap/Bank Assets	0.06	0.57	-0.04	-0.556	-0.062	-1.27	-0.041	-0.704	-0.052	-1.558	0.064*	1.669
No. of Branches	0.001	0.137	0.003	0.007	0.0001	1.354	0.0003	0.279	0.003	1.395	0.002	-1.296

*Significant at the 10 percent level. ** Significant at the 5 percent level. *** Significant at the 1 percent level.

Table 5 (continued)

	Fransi Bank				Hollandi Bank				Investment Bank			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.73		0.89		0.85		0.87		0.76		0.91	
Bank Assets/GDP	0.029	0.735	0.018	0.824	0.03	0.858	-0.028	-0.809	0.043	0.693	0.035	0.863
Stock MKT Cap./ GDP	-0.065	-0.779	-0.04	-0.843	-0.104	-1.382	0.094	1.294	0.01	0.077	-0.112	-1.285
Stock MKT Cap/Bank Assets	0.045	0.852	0.028	0.99	0.054	1.161	-0.057	-1.272	0.013	0.157	0.083	1.56
No. of Branches	0.0002*	-1.662	0.004***	-3.111	.0001***	-3.332	0.003*	-1.758	-0.0004	-0.828	-0.0006	-0.957
	Al-Jazerah Bank				**National Bank**				**Rajhi Bank**			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.66		0.61		0.70		0.83		0.89		0.78	
Bank Assets/GDP	0.65	1.161	-0.535	-1.013	0.005	0.204	-0.0 36	-1.978	-0.090***	-3.981	0.016***	3.21
Stock MKT Cap./ GDP	-0.53*	-2.164	0.072	0.959	-0.053	-0.99	0.079*	2.015	-.225****	-3.28	0.064***	3.53
Stock MKT Cap/Bank Assets	.0039	1.87	-0.844	-1.232	0.024	0.693	-0.055**	-2.298	0.017***	3.69	-0.010***	3.93
No. of Branches	-0.006	-1.314	0.0089	0.222	0.023	0.429	.0009**	2.502	0.0033**	3.44	0.0400***	4.23

*Significant at the 10 percent level. ** Significant at the 5 percent level. *** Significant at the 1 percent level.

Table 5 (continued)

	Riyad Bank			
	Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat
Model R Square	0.67		0.83	
Bank Assets/GDP	-0.019	-0.483	0.031	1.033
Stock MKT Cap./ GDP	0.03	0.362	-0.054	-0.857
Stock MKT Cap/Bank Assets	-0.02	-0.399	0.039	1.014
No. of Branches	0.0001	0.003	-0.0001*	-1.669

*Significant at the 10 percent level. ** Significant at the 5 percent level. *** Significant at the 1 percent level.

Table 6
Regression Results on Bank Profitability and Private/Public Lending

(6) $Y_{it} = \Psi_{i0} + \Psi_{i1}(F_{it1}) + \Psi_{i2}(F_{it2}) + E_{it}$

Where Y_{it} is profitability of the i^{th} bank in year t as measured by equation (1) by dividing the bank before-tax profit by its total assets, F_{it1} is the bank's claims on private sector in year t, and F_{it2} is the bank's claim on public sector in year t.

	American Bank				**Arab Bank**				**British Bank**			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.93		0.92		0.94		0.95		0.98		0.98	
Claims on private sector	0.33***	3.878	0.23***	3.408	0.17***	6.174	0.11***	5.365	0.57***	5.735	0.63***	5.349
Claims on public sector	0.41**	2.653	0.37**	2.259	0.39***	5.043	0.22***	3.987	0.48***	3.571	0.46***	3.204
	Fransi Bank				**Hollandi Bank**				**Investment Bank**			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.97		0.98		0.94		0.96		0.98		0.97	
Claims on private sector	0.12***	4.672	0.051***	4.192	0.30***	3.655	0.59***	2.965	0.17**	2.223	0.05	0.73
Claims on public sector	0.32**	2.689	0.16**	2.111	0.29**	2.427	0.025	1.31	0.14***	3.419	0.07	1.18

*Significant at the 10 percent level. ** Significant at the 5 percent level. *** Significant at the 1 percent level.

Table 6 (continued)

	Al-Jazerah Bank				**National Bank**				**Rajhi Bank**			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.92		0.91		0.97		0.98		0.97		0.97	
Claims on private sector	0.12**	2.034	0.28**	2.19	0.22**	2.192	0.46***	5.575	0.13*	1.723	0.09*	1.891
Claims on public sector	0.09*	1.77	0.13*	1.69	0.17*	1.66	0.38***	3.233	0.10*	1.885	0.17*	1.931

	Riyad Bank			
	Simultaneous		Lag	
	coef.	t-stat	coef.	t-stat
Model R Square	0.97		0.99	
Claims on private sector	0.61***	5.828	0.41***	3.845
Claims on public sector	0.219***	4.026	0.31**	1.98

*Significant at the 10 percent level. ** Significant at the 5 percent level. *** Significant at the 1 percent level.

Table 7
Regression Results on Bank Profitability and the Impact of Oil Variables

(7) $Y_{it} = \Psi_{it0} + \Psi_{i1}(F_{it}) + \Psi_{i2}(F_{it2}) + \Psi_{i3}(F_{it3}) + \Psi_{i4}) + E_{it}$

Where Y_{it} is profitability of the i^{th} bank in year t as measured by equation (1) by dividing the bank before-tax profit by its total assets, F_{it1} is oil proven reserve in year t, F_{it2} is average oil prices in year t, Fit_3 is the oil export/total export ratio of the country in year t, and F_{it4} is the oil export/GDPratio in year t.

	American Bank				Arab Bank				British Bank			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
Model R Square	0.30		0.76		0.49		0.33		0.46		0.31	
Oil reserves	-0.001	-0.264	-0.002	-0.861	-0.0007	-0.032	0.0005	0.169	0.0006	-0.296	0.0001	0.404
Oil prices	0.432**	1.977	0.301*	1.799	0.201*	1.676	0.336**	1.918	0.101*	1.824	0.221*	1.758
Oil exports/total exports	0.222*	1.761	0.236***	3.031	0.219**	1.956	0.256*	1.801	0.031	0.811	0.115*	1.528
Oil exports/GDP	0.114*	1.801	0.058	1.375	0.083	1.27	0.034	0.504	0.029	0.796	0.033	0.887

*Significant at the 10 percent level. ** Significant at the 5 percent level. *** Significant at the 1 percent level.

Table 7 (continued)

	Fransi Bank				Hollandi Bank				Investment Bank			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
lodel R Square	0.68		0.71		0.59		0.83		0.35		0.44	
il reserves	-0.001	-0.394	-0.001	-0.833	0.0001	0.241	0.0002	0.722	.00003	0.300	.00001	0.076
il prices	0.001***	3.684	0.001***	4.281	0.002***	3.343	0.002***	6.224	0.233*	1.805	0.239*	2.278
il exports/total exports	0.238*	1.911	0.057*	1.618	0.012	0.23	0.012	0.324	0.415***	2.415	0.111*	1.886
il exports/GDP	0.187***	3.477	0.118***	3.593	0.109**	2.204	0.163***	4.710	0.158*	1.644	0.004	0.030

	Al-JazerahBank				National Bank				Rajhi Bank			
	Simultaneous		Lag		Simultaneous		Lag		Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat	coef.	t-Stat
lodel R Square	0.33		0.37		0.66		0.56		0.61		0.93	
il reserves	0.003	1.396	0.002	1.252	0.0004	0.381	0.0003**	1.881	0.0003	1.112	-0.001**	-2.038
il prices	0.223**	2.376	0.208*	1.728	0.315**	1.997	-0.398*	1.818	0.001	0.552	0.303**	3.816
il exports/total exports	0.154*	1.798	0.705**	2.400	0.076**	2.846	0.059**	2.106	0.112	1.555	0.277***	2.741
il exports/GDP	0.518	0.698	0.355	0.573	0.012	0.452	0.015	0.561	0.021	0.568	0.091*	3.129

*Significant at the 10 percent level. ** Significant at the 5 percent level. *** Significant at the 1 percent level.

Table 7 (continued)

Riyad Bank

	Simultaneous		Lag	
	coef.	t-Stat	coef.	t-Stat
Model R Square	0.53		0.33	
Oil reserves	0.0004	0.885	0.0003	0.654
Oil prices	0.001*	2.603	0.001*	1.736
Oil exports/total exports	-0.013	-0.318	-0.009	-0.154
Oil exports/GDP	0.056	1.430	0.064	1.171

*Significant at the 10 percent level. ** Significant at the 5 percent level. *** Significant at the 1 percent level.

All ratios are expressed in terms of asset size. According to Demirguc-Kunt and Huizinga (1999), "large banks tend to have lower margins and profits and smaller overheads. The also pay relatively low direct taxes and have lower loan loss provisioning."

The empirical results in Table 3 show that there is a positive relationship between all bank profits and the equity/asset ratio. The regression coefficients, whether based on simultaneous or lagging regression, are statistically significant at the 0.10 and 0.05 levels, and only one is significant at the 0.01 level. The coefficients of determination are relatively high given the degrees of freedom and number of dependent variables, as their values range between 0.43 and 0.84.

On loan/asset ratio, the results show that there is a positive relationship, mostly significant, except in the case of the Al-Rajihi Bank. It does not use interest in its lending, rather it follows Islamic banking tradition and functions much like a mutual saving bank in the New England region of the United States. Relationships with non-interest earning assets/assets ratio are negative and mostly significant. This may show that most of the profitability of Saudi banks, including those with no foreign participation, is derived from traditional commercial banking, not fee-based banking, although there is a push toward fee-based business. Overhead cost is negatively related to profitability, as overhead may be sizeable enough to eat up a large portion of before-tax profit, as manifested by the negative and mostly statistically significant coefficients. This empirical result is probably due to the numerous and costly branches scattered all over Saudi cities and towns, or it may be explained by a bank business and product mix which requires high overhead costs.

On the impact of foreign ownership/assets ratio, it is expected that the higher the percentage of foreign ownership in Saudi banks the higher the profitability. Banks with foreign ownership usually benefit from the expertise and facilities extended to them by the parent foreign bank. In addition to providing management, foreign banks now may have up to 40% ownership. Five of the ten Saudi banks are now managed and partially owned by British, U.S., Dutch, French, and Jordanian multinational banks. In our models, however, we did not capture the differential quality of expertise of foreign banks. There also no differential tax rates, as all of the banks are treated as Saudi banks paying 2.5% in *zakat* (Islamic tax) on their annual net worth or net working capital.

Empirical results in Table 3 substantiate the benefits of foreign participation in Saudi banks. The regression coefficients are positive and statistically significant for all banks with foreign participation in terms of capital and management; whereas the coefficients for purely local banks are not statistically significant.

The results tend to confirm that Saudi banks' high equity structure resulted in higher return on assets and lower return on equity. The non-interest earning assets to total assets ratio also includes non-lending activities such as brokerage services, since as highlighted before, Saudi banks are currently the only ones authorized to engage as share brokers.

A reduction in net interest margin does not also mean improved efficiency, but can imply a reduction in bank taxation or a higher loan default—the first may prove a more efficient banking system, the second the opposite. Saudi banks pay a flat 2.5% *zakat*, while foreign equity partners pay a higher rate on their net earnings starting from the period after their tax-free holiday agreements expire. However, Saudi banks do not receive any returns on their statutory reserve requirements held with SAMA, which averaged around 4.2%, and this acts as an indirect taxation on Saudi banks. One effect of such an indirect taxation is to allow banks to pass on the cost of such taxation to their borrowing clients.

What the model also highlights is that banks that rely on deposits on funding are somewhat less profitable than those that are less dependent, due to the higher cost of branching and the overhead that it entails. This is especially true for the Saudi banks with the most branch networks—NCB and Riyad Bank.

Difference in bank overheads may also capture differences in the banks' business segmentation and product mix, as Saudi banks have approached their markets with different segmentation strategies. The "pure" Saudi banks such as NCB, Riyad, and Al Rajhi have emphasized retail as opposed to corporate business segments, while Saudized banks such as SAMBA, Saudi British, Saudi Fransi, and Saudi Hollandi, have concentrated on the corporate/treasury segments.

On the issue of foreign ownership and profitability, the individual bank results are mixed. The general assumption is that banks in developed countries earn higher interest margins than their domestic counterparts in developing countries because of their having a technological and management edge (Demirguc-Kunt and Huzinga, 1999). This seems to be the case for the more technologically advanced foreign-managed banks such as the Saudi American

Bank and the Saudi British Bank (which can also draw upon a wider international connection than the others), but the fact that it is not clear cut, implies that the policy of Saudization has allowed the western technology expertise and the technical know-how of the foreign banks to filter down to all the Saudi banking sector.

Profitability and Market Power

The regression model here measures the degree of association between total profitability and market structure variables which include concentrations ratios, the number of banks, and total bank assets. Berger (1995a), Gilbert (1984), and Goldberg and Rai (1996) used these variables as proxies for the power of the commercial bank's market.

The estimated coefficients of the model are:

$$(3)\quad Y_{it} = 0.04 + \underset{(2.34)}{0.43(F_{t1})} + \underset{(2.96)}{057(F_{t2})} + \underset{(1.88)}{0.49(F_{t3})} + \underset{(1.98)}{0.76(F_{t4})} + E_{it}$$

t-stat

$R^2 = 0.61$

The above estimated regression coefficients are positive and statistically significant at either 0.01, 0.02, 0.05, or 0.10 level, indicating that total bank profitability is directly affected by the degree of market power. This finding could be interpreted to indicate that high concentration ratios may induce banks to charge borrowers with higher interest rates than under low banking concentration. Studies conducted in this area of concentration and economic efficiency have confirmed similar findings in other countries [Pajamo (1993), Shaffer (1998) and Cotovelli and Gambera (2001)]. The non-interventionist policy of SAMA in this area of bank regulation could have played a contributing factor, but the result could be hampering companies' growth—particularly small and medium-sized enterprises—due to more restrictive credit conditions by the banks brought on by imperfect competition.

Profitability and Macroeconomic Indicators

The third regression model measures the degree of association between profitability and macroeconomic indicators. These indicators are: per capita GDP, inflation, short-term interest rate, and the budget/GDP ratio. Per capita GDP is a measure of the economic development of the country, and the variable inherently captures the banking product mix, technology, and regulations, none of which are included in the regression model. Therefore, we did not expect a significant positive relationship, and this is exactly what we got. The empirical results show insignificant coefficients for most of the Saudi

banks. Notwithstanding, Al-Jazira Bank, National Bank, and Al-Rajhi Bank—all without foreign equity participation—have mostly negative and significant coefficients. This could be explained by the decline in government expenditures and private investment during the many years in which world oil prices plummeted, which might have prompted banks to cut overhead, leading to higher profits, which were simultaneously magnified by the earnings generated from banks' investment in high-yield government treasury securities.

Bank profitability can be affected by inflationary trends (the second variable in the model) which are associated with a higher realized interest margin and higher profitability. This is especially true in developing countries, where high real interest rates accompany higher interest margins and profitability. In Saudi Arabia, SAMA reported an annual decline in inflation rates during the last ten years of the study. This is probably why most of the regression coefficients are negative and significant while few are negative but insignificant.

According to SAMA, the combined balance sheet of the Saudi banks showed demand deposits at around 45% for December 2002, while time and savings deposits were around 33% for the same period. (SAMA, December 2002). The figures were 42% and 33% for 1996. The rise in demand deposits could have been due to the need to hold more such deposits towards the end of 2002, due largely to the government launching its share offering in Saudi Telecommunication Company (STC) in December 2002.

According to SAMA, anti-inflationary measures in Saudi Arabia have been effective (SAMA 2002), with the consumer price index showing a decline by 0.8% in 2001 and a five-year average decline of 0.66% for the period 1997-2001. The coefficients of this variable were not statistically significant and did not seem to play an important role in bank profitability.

One would however, have expected positive and significant coefficients of the size of the budget/GDP ratio. Saudi Arabia has been running a consistent budget deficit from 1985 to 2001, with the exception of 2000 (SAMA 2002). The Saudi government has resorted to Saudi banks to fund a major part of this deficit, the profitability effects will be analyzed below. However, it is sufficient to state here that the actual budget/GDP ratios have not had a direct effect on bank profitability. The yield of short-term Saudi government bonds, was negatively related, or insignificantly positively related to profitability, as spread between the cost of funding and the bank lending rates increases, profitability increases.

Profitability and Financial Structure

Here, the regression model estimates the degree of association between profitability and a set of financial structure indicators such as bank assets/GDP ratio, stock market capitalization/GDP ratio, and stock market capitalization /total bank assets. The relevance of these variables are well established in economics since they gauge the significance of relative bank and stock market finance in terms of GDP and the market power of banks. These variables show how much bank financing is competing with financing obtained via the stock market, i.e., they indicate the country's relative amount of debt financing and equity financing. The higher the debt/equity ratio of a country, the higher the perceived risk. A lower ratio indicates that equity financing is contributing more to the growth of the economy, which would enhance the borrowing capacity of the companies, and ultimately increase the demand for debt, including bank, financing (see Boyd and Smith, 1996).

The estimated coefficient for the bank assets/GDP ratios contained in Table 5 are mostly negative but statistically insignificant. This negates the hypothesis that interbank competition exists but is not intense enough to support charging borrowers favorable interest rates. The results for the measures of stock market variables are interesting as they point towards higher profitability for the banks as stock market capitalization increases, but with time lag effect. Results of simultaneous regression indicate mostly negative, but insignificant. This unclear picture may be explained by the undeveloped, bank-driven stock market and the absence of a watchdog, such as the SEC.

The effect between bank concentration and measures of stock market size, plus the adverse impact this might have on the Saudi economy as measured by GDP, per capita, and the size of the stock market, has been explored elsewhere (Essayyad and Madani, 2003) and seems to corroborate the profitability findings of this paper. The Saudi stock market is capitalized at around $70 billion with 71 stocks listed, the biggest in terms of size in the Arab world, but small in terms of number of stocks listed and market capitalization to GDP. (Al-Dukheel, 2002). The Saudi stock market ratio for market capitalization GDP is around 39%, while those for the USA, U.K, and France are over 100% with 78% for Japan (Al-Dukheel, *Emerging Markets Fact Book*, 2002) The high profitability plus the concentration in the Saudi banking sector could have led to lower economic growth and slower than warranted capitalization of the Saudi stock market. Turnover (liquidity) ratio is low at 29%. The new Capital Market Law will open up the brokerage business to independent brokerage houses and provide for an increase in the number of listed companies from the current level of 71. These actions, plus the announced privatization program

would assist in the growth of Saudi GDP on the assumption that capital investments increase.

In times of slower GDP growth, the oil sector is most affected in Saudi Arabia, but the non-oil sector has gradually overtaken the oil sector as being the prime component of GDP, accounting for around 66% of GDP in 2001 at constant 1999 prices. This growth in the non-oil GDP component, as well as the short-term nature of most Saudi bank credit (75% under three years), has contributed to relatively high Saudi bank profitability.

Our empirical results did not provide evidence to support the hypothesis that banks which are partly owned by the government act as cartels and are not interested in serving as profit optimizers with no incentive to establish aggressive lending relationships. Both Riyad Bank (38% government owned) and NCB (80% government owned) exhibited relatively the same characteristics as the non-government owned banks.

Profitability and Lending (Private versus Public)

Profitability is related to lending but not always highly positive. The default risk of a loan portfolio could affect profitability in a negative manner. Furthermore, whether a loan portfolio contains government or corporate loans affects the risk of loans and consequently bank profitability. Saudi banks like banks in other developing countries invest in public as well as private loans. Table 6 shows that there is a significant positive relationship between profitability and lending, whether public or private lending.

Due to declining oil prices outside Saudi government control, the Saudi government has run persistent budget deficits since 1985. Because there has been no direct or indirect taxation imposed in Saudi Arabia, the range of revenue generating policies is rather limited with the result that the government turns towards the banking sector and other captive financial institutions (such as the government pension organizations) to fund these deficits.

The total Saudi domestic public debt is estimated to be around $70 billion, or nearly 98% of GDP for 2002. Of this, the Saudi bank share stood at around $33 billion as of December 2002, up sharply from $17.5 billion in 1996. (*SAMA Annual Report* 2002). The fear is that such government borrowing will lead to "crowding out" of private sector credit by the government. The government's short term securities and long-term bonds are priced at a premium, which SAMA considers appropriate, over comparable U.S. securities, and U.S. dollars/SR interest rate swaps *(SAMA Annual Report* 2002). Unlike the situation in other oil producing countries, severe declines in

oil prices and government budget deficits is not a very pessimistic scenario for Saudi banks, as they seem to benefit from both private sector lending in a budget surplus environment, and from lending relatively more to the public sector in times of budget deficits. The highly negative correlation figures show that indeed the Saudi banks cannot fund both private and public sectors at the same pace, but that their profitability is generally highly associated with either. Only Al-Jazira bank results are not statistically significant, reflecting the position of this smallest Saudi bank which seems to be positioning itself to become Saudi Arabia's first Islamic financial institution with most of its current operations being in short term Islamically acceptable trade finance transactions.

Profitability and Impact of Oil Variables

We estimate the degree of association between profitability and oil indicators such as proven reserves, average prices, oil export/total export ratio, and oil export/GDP ratio.

The results (see Table 7) reconfirm the previous findings in this area carried out by Essayyad and Madani (2003). It is expected that the impact of the oil sector should play an important part on Saudi bank profitability as revenues from oil export and oil-based industries represent the premier source of national income. However, a severe decline in oil prices is not a very pessimistic scenario for banks operating in Saudi Arabia due to government borrowing from banks in times of deficits, creating something called by economists as "monopsony" since the government is the largest major customer (borrower) or "oligoposony" since the government and major Saudi companies are the few customers (borrowers).

The empirical results in Table 7 show that the relationship between Saudi bank profitability and proven oil reserves is statistically insignificant, irrespective of using simultaneous repgession or regression with time lag. Research has shown that the oil majors finance their needs from non-bank sources. However, the empirical results show that Saudi bank profitability is affected by both oil prices and the relative size of oil exports. One would expect this result since revenues from oil exports and the oil dependent petrochemical industries represent the major source of Saudi national income, and Saudi bank profitability would be affected by positive or negative movements in oil prices.

Concluding Remarks

In this paper we have investigated the determinants of the profitability of Saudi banks. We examined the following six sets of variables: bank characteristics, market power, macroeconomic indicators, financial structure, loan portfolio, and oil sector. The empirical results are summarized here. First, our empirical results show that there is a significant positive relationship between bank profits and bank characteristics as proxied by equity/asset ratio and loan/asset ratio, whereas relationships with non-interest earning assets/assets ratio are negative and mostly significant. This may explain why the profitability of Saudi banks, including those with no foreign participation, is mainly derived from traditional commercial banking, as opposed to fee-based banking. Overhead cost is negatively related to the profitability, as overhead cost may be sizeable enough to eat up a large portion of before-tax profit. On the impact of foreign ownership/assets ratio, empirical results confirm the benefits of foreign participation in boosting the profitability of Saudi banks, as the regression coefficients are positive and statistically significant for those banks having foreign capital and management; whereas, the coefficient for purely local banks are not as statistically significant. Difference in bank overheads may also capture differences in the bank's business segmentation and product mix. Saudi banks approach their markets with different segmentation strategies.

Second, we found that total bank profitability is directly affected by the degree of market power. The high concentration ratios might have enabled the banks to charge borrowers more excessive interest rates. The results show an insignificant relationship between profitability and per capita GDP/assets ratio. This could be explained by the decline in the market money supply which might have resulted from the decline of both government spending or/and private investments during the years in which world oil prices plummeted, prompting direct and overhead cost cutting. Furthermore, earnings generated from banks' holdings of relatively high-yield Saudi treasury securities might also have contributed to the net rise in bank profitability, despite the decline in per capita GDP.

Third, one would expect a significant relationship between profitability and macroeconomic indicators. These indicators are: per capita GDP, inflation, the short-term interest rate, and the budget/GDP ratio. Empirical results show insignificant coefficients for most of the Saudi banks. However, Al-Jazira, National, and Al-Rajhi banks—all without foreign equity participation—have mostly negative and significant coefficients. The relationship between bank profitability and inflation is negative and significant in most cases except for

a few banks which have negative but insignificant coefficients. Fourth, the estimated coefficients for bank assets/GDP ratios are mostly negative but statistically insignificant, which does not support the hypothesis that interbank competition is existent but not intense enough to justify charging borrowers favorable interest rates. The results for the measures of stock market variables are interesting as they point towards higher profitability for the banks as stock market capitalization increases but with a time lag.

Empirical results show that there is a significant positive relationship between profitability and lending, whether public or private lending, implying that diversification of loan portfolio between private and public sectors has been positive. Finally, empirical results show that the relationship between Saudi bank profitability and proven oil reserves is statistically insignificant, irrespective of using simultaneous repression or regression with time lag. However, the empirical results show that Saudi bank profitability is affected by both oil prices and the relative size of oil exports. One would expect this result since revenues from oil exports and the oil-dependent petrochemical industries represent the major source of Saudi national income, and Saudi bank profitability would be affected by positive or negative movements in oil prices.

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