The Employment Of Modern Financial Tools In The Exercise Of Historical Analysis: The Case Of The National Bank Of Greece (1842-1941)

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Abstract

The purpose of this paper is to show how we can use modern financial tools in the exercise of historical analysis. In other words, this article is the first one, which illuminates the intersection between the two different economic disciplines of Financial Analysis and Economic History. This is accomplished by shedding some light in the performance of the biggest Greek bank during the first hundred years of its operation; that is, the period 1842-1941. The main conclusions of the analysis is that the National Bank experienced a quite high (i.e. above 20%) return on equity during the period 1920-27, while its return on assets was quite high (i.e. above 2%) during the period 1843-89. Last but not least, the National Bank utilised financial leverage heavily to increase return on equity during the period 1913-27.

1. Introduction

The National Bank of Greece is the biggest financial institution in Greece and one of the 200 biggest worldwide. The size of the National Bank in relation to the Greek banking system becomes apparent if we take into account that the market share of the National Bank accounted for 32% of the assets of all commercial Greek banks in 2000. In addition, the National Bank accounted for 25% of deposits and 35% of loans regarding the industry concerned in 2000.¹ This relationship is not a current fact but it is detectable from the establishment of the National Bank of Greece almost 160 years ago.

The National Bank of Greece was established in 1841, while its first balance sheet appeared the following year. The Bank had two departments: the issuing department and the banking department. In other words, it was a commercial bank but it had all the responsibilities and privileges of a central bank. In fact, the National Bank was the sole issuer of banknotes from 1842 to 1863 and then again from 1920 to 1928. This privilege was not exercised by the National Bank after 1928. In 14 May 1928 the Bank of Greece was established and assumed the exclusive privilege of banknote issue. It should be noted, however, that there were three other issuing banks. The issue privileges of these banks were restricted to much smaller territories that were united with Greece at later dates. The Ionian Bank, established in 1839, enjoyed the exclusive privilege of banknote issue in the Ionian Islands only. This privilege was withdrawn in 1920. The Bank of Epirus and Thessaly, established in 1880, had the exclusive privilege to issue banknotes in Epirus and Thessaly. In 1899 the National Bank took over the Bank of Epirus and Thessaly, thus obtaining the privilege for its territory. The Bank of Crete, established in 1899, had the exclusive privilege of issuing banknotes in Crete. This privilege was withdrawn in 1919.

The main purpose of this paper is to show how we can use modern financial tools in the exercise of historical analysis. There has not been any previous attempt in the literature to tackle this issue. In other words, this

¹ For more information see Hellenic Bank Association (2002).

article is the first one, according to the author's knowledge, which illuminates the intersection between the two different economic disciplines of Financial Analysis and Economic History. This is accomplished by shedding some light in the performance of the biggest Greek bank during the first hundred years of its operation; that is, the period 1842-1941. We choose to explore this particular banking firm because it was the first and the biggest fund provider of the Greek State as well as all the sectors of the Greek economy, during the period examined. There was no other financial institution with an equivalent impact on the Greek Economy and interrelationship with the Greek State, during this period.² The study is divided into two main parts. The first section outlines the employed profitability ratios, while the second reports the source of the data and the computed ratios and analyses the results. And finally concluding remarks are presented.

2. The Profitability Measures

The analysis of the National Bank's financial performance employs two measures, the return on equity (ROE), and the return on assets (ROA). Return on equity equals net income divided by common equity capital (par value, paid in surplus, undivided profits, and capital reserves). This ratio is probably the most popular measure of a bank's financial performance among investors and senior managers. It is a measure of the efficiency with which the bank employs owners' capital, because it presents the amount that has been earned on the book value of common stockholders' investment in the bank. In other words, this ratio measures the percentage return to owners on their investment in the bank. Return on assets equals net income divided by total assets. A bank's return on assets reflects management's ability to allocate and utilise all the financial resources of the firm to generate net income. In other words, this ratio measures the percentage return on all invested funds in the bank.

A bank's return on equity can be decomposed into two principal components, its return on assets and its leverage multiplier (or equity multiplier - LM)³. This relationship is generated as follows:

$$\begin{aligned}
 \text{ROE} &= \frac{\text{Net Income}}{\text{Equity Capital}} \\
 \text{ROE} &= \frac{\text{Net Income}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Equity Capital}} \\
 \text{ROE} &= \text{ROA} \times \text{LM}
 \end{aligned}$$

Consequently, a bank can increase its return on equity by increasing its return on assets and/or its leverage multiplier. The leverage multiplier compares assets with equity such that large values imply a large amount of debt financing relative to equity. Thus, the leverage multiplier measures the financial leverage⁴ used by a bank and influences its return on equity. This is because it has a multiplier impact on return on assets to determine a bank's return on equity. At the same time the leverage multiplier represents a measure of financial risk⁵ of the firm, because it reflects how many assets can go into default before a bank becomes insolvent. Let us use an example to make

² For more information see Valaoritis (1902), Dertilis (1980), Eulambio (1924), Kostis and Tsokopoulos (1988), Pyrsos (1946), Kostelenos et. al. (2003), Kostelenos (1995), Houmanidis (1991), and Houmanidis (2002).

³ For more information see Vasiliou (1999).

⁴ Financial leverage is the use of debt having a fixed cost to magnify the expected return on equity; this situation occurs whenever the expected return on assets exceeds the cost of debt.

⁵ Financial risk is the increased variability in returns to common stockholders (i.e. ROE) as a result of the decision to finance a portion of the firm's assets with debt and/or preferred stock. In other words, financial risk is caused by the use of financial leverage.

apparent the concept of leverage multiplier. Consider two commercial banks, called A and B, that each hold USD 100 million in assets with identical quality and composition. Bank A finances its assets with USD 10 million equity capital, while bank B with only USD 5 million. In this case the leverage multiplier of bank A equals $(100/10=)$ 10, and of bank B equals $(100/5=)$ 20. Let us suppose that both banks enjoyed a 1% return on their assets. In this case, bank A would offer to its stockholders a return on equity of 10%, while bank B would provide them with 20%. On the other hand, if both banks reported a return on their assets of -1%, bank B would announce a loss twice as much of bank A (i.e. $ROE_B=-20\%$, $ROE_A=-10\%$). Furthermore, the leverage multiplier is a risk measure. Consider the ratio “equity capital / total assets” (i.e., the ratio 1/LM), in the above example. This ratio equals $(10/100=)$ 10% for bank A, and $(5/100=)$ 5% for bank B. The different ratios signify that although both banks hold identical assets, bank A is exposed in less financial risk than bank B. The assets of bank A that can go into default before it becomes insolvent (i.e. 10%), are twice as many of the assets of bank B (i.e. 5%). From the above it follows, that a high leverage multiplier raises a bank’s return on equity when net income is positive, but it also signals high financial risk. This is because financial leverage magnifies the impact of a negative return on assets on a bank’s return on equity, so as leverage is a two-edged sword.

Return on assets is lower for banks than for most non-financial business. For this reason, most financial institutions utilise financial leverage heavily to increase return on equity to a competitive level. In general, firms with highly predictable and stable cash flows can utilise more financial leverage than firms facing a high degree of uncertainty. Moreover, firms such as commercial banks which have a diversified portfolio of liquid assets can safely employ more financial leverage, than the characteristic non-financial institutions. However, investments that are exposed to low risk, have high degree of liquidity and generate relatively stable cash flows tend to produce low returns. Commercial banks are notable examples of this pattern. The National Bank does not deviate from this rule at the present time.⁶ In 2001, as an example, the National Bank combined a remarkably low return on assets of 1.40% with an enormous leverage ratio of 20.49 to produce an attractive return on equity of 27%. This policy is presented in Table I.

Table I
Financial Performance Ratios of the National Bank of Greece

	1998	1999	2000	2001
ROA (%)	1.38%	2.61%	2.23%	1.40%
LM (x)	25.14	15.86	15.25	20.49
ROE (%)	38.04%	50.04%	37.40%	27.00%

Notes:

1. Discrepancies are due to rounding.
2. ROA and ROE are profit before taxes as a percentage of average total assets and average shareholders’ equity respectively.

Source: National Bank of Greece, Investor Relations, Financial Highlights of NBG Group, www.nbg.gr

3. The Data

The data employed to construct profitability ratios are obtained from the balance sheets, which are in the Annual Reports of the Governor of the National Bank of Greece, published between 1842 and 1941. In consequence, the quality of these data appears rather unquestionable.

⁶ For more information see Vasiliou (1997).

4. Pointing to the Best Years

Table II illustrates the calculation of the key ratios measuring the National Bank's returns and the financial leverage it has taken to obtain these returns. Figures 1-3 present a graphical exposition of these measures. The above table and figures point to the following major conclusions.

Table II
Financial Data And Ratios Of The National Bank

Years	Net income	Assets	Equity	ROE	ROA	LM
1842	137,125.26	6,942,700.81	3,949,000.00	3.47%	1.98%	1.76
1843	307,685.86	7,495,072.57	3,982,785.13	7.73%	4.11%	1.88
1844	361,716.91	7,596,318.85	4,039,064.12	8.96%	4.76%	1.88
1845	438,399.46	8,700,781.92	4,155,405.35	10.55%	5.04%	2.09
1846	479,809.93	9,791,417.51	4,483,376.80	10.70%	4.90%	2.18
1847	631,132.04	10,331,617.06	5,221,338.00	12.09%	6.11%	1.98
1848	472,706.51	7,069,423.42	5,241,752.46	9.02%	6.69%	1.35
1849	554,020.30	8,563,523.94	5,099,883.00	10.86%	6.47%	1.68
1850	552,132.44	9,615,086.79	3,367,468.00	16.40%	5.74%	2.86
1851	624,358.87	9,589,930.98	5,476,397.00	11.40%	6.51%	1.75
1852	664,307.98	9,977,362.22	5,617,230.00	11.83%	6.66%	1.78
1853	328,507.23	10,764,190.63	5,838,482.40	5.63%	3.05%	1.84
1854	709,904.33	12,739,684.62	6,278,400.00	11.31%	5.57%	2.03
1855	667,244.49	14,551,790.60	6,285,600.00	10.62%	4.59%	2.32
1856	782,039.73	17,798,126.22	6,307,200.00	12.40%	4.39%	2.82
1857	567,544.43	21,856,819.68	6,348,000.00	8.94%	2.60%	3.44
1858	1,153,122.97	20,916,469.61	6,386,400.00	18.06%	5.51%	3.28
1859	1,229,848.16	22,556,480.02	6,424,800.00	19.14%	5.45%	3.51
1860	1,757,610.62	26,723,251.59	6,487,200.00	27.09%	6.58%	4.12
1861	2,221,053.80	29,648,383.31	6,334,400.00	35.06%	7.49%	4.68
1862	1,299,754.86	34,128,743.70	10,137,913.78	12.82%	3.81%	3.37
1863	1,162,031.17	37,089,021.16	10,343,144.95	11.23%	3.13%	3.59
1864	1,876,196.56	46,117,104.42	16,680,385.01	11.25%	4.07%	2.76
1865	2,058,980.16	48,136,791.55	16,984,365.17	12.12%	4.28%	2.83
1866	2,601,289.32	49,404,797.17	20,995,429.32	12.39%	5.27%	2.35
1867	2,390,498.97	57,111,810.36	21,279,928.29	11.23%	4.19%	2.68
1868	2,548,806.30	60,511,829.60	21,689,734.59	11.75%	4.21%	2.79
1869	2,919,196.01	67,169,957.53	22,088,930.60	13.22%	4.35%	3.04
1870	3,097,272.03	73,420,336.86	24,043,302.63	12.88%	4.22%	3.05
1871	3,171,567.63	75,973,544.76	24,606,870.26	12.89%	4.17%	3.09
1872	3,259,640.24	74,774,472.30	24,610,660.10	13.24%	4.36%	3.04
1873	3,762,949.25	89,164,196.35	24,619,059.75	15.28%	4.22%	3.62
1874	4,692,585.98	99,748,864.56	30,630,000.00	15.32%	4.70%	3.26
1875	4,719,509.38	96,753,141.44	30,630,000.00	15.41%	4.88%	3.16
1876	4,399,377.07	98,194,939.53	30,630,000.00	14.36%	4.48%	3.21
1877	4,359,010.34	110,265,237.73	30,630,000.00	14.23%	3.95%	3.60

1878	4,514,091.01	130,411,169.54	30,630,000.00	14.74%	3.46%	4.26
1879	4,944,295.65	129,564,789.81	30,630,000.00	16.14%	3.82%	4.23
1880	4,739,537.54	156,841,209.56	30,630,000.00	15.47%	3.02%	5.12
1881	5,029,799.63	203,430,276.59	30,630,000.00	16.42%	2.47%	6.64
1882	5,837,890.18	225,569,495.90	30,630,000.00	19.06%	2.59%	7.36
1883	5,518,763.57	220,476,489.10	27,348,220.00	20.18%	2.50%	8.06
1884	3,106,900.65	213,021,904.75	34,848,220.00	8.92%	1.46%	6.11
1885	6,486,495.70	222,732,998.59	34,848,220.00	18.61%	2.91%	6.39
1886	6,710,852.89	261,093,579.36	34,848,220.00	19.26%	2.57%	7.49
1887	5,785,609.73	258,986,503.15	34,848,220.00	16.60%	2.23%	7.43
1888	5,086,526.85	252,509,785.71	34,848,220.00	14.60%	2.01%	7.25
1889	5,240,174.66	250,014,469.10	34,848,220.00	15.04%	2.10%	7.17
1890	5,171,383.73	265,436,580.69	34,848,220.00	14.84%	1.95%	7.62
1891	4,549,559.30	275,712,288.33	34,848,220.00	13.06%	1.65%	7.91
1892	4,051,475.20	269,730,856.27	34,848,220.00	11.63%	1.50%	7.74
1893	3,008,458.62	266,569,226.02	31,500,000.00	9.55%	1.13%	8.46
1894	2,472,670.19	246,347,192.90	31,500,000.00	7.85%	1.00%	7.82
1895	1,954,949.05	244,429,745.38	31,500,000.00	6.21%	0.80%	7.76
1896	2,057,428.24	248,264,549.57	31,500,000.00	6.53%	0.83%	7.88
1897	2,076,106.96	271,731,243.35	31,500,000.00	6.59%	0.76%	8.63
1898	2,374,634.56	285,206,415.00	31,500,000.00	7.54%	0.83%	9.05
1899	3,018,312.72	310,906,883.87	31,500,000.00	9.58%	0.97%	9.87
1900	3,438,512.87	315,345,530.51	33,500,000.00	10.26%	1.09%	9.41
1901	3,660,639.14	329,988,672.21	33,500,000.00	10.93%	1.11%	9.85
1902	3,758,132.45	349,835,505.87	33,500,000.00	11.22%	1.07%	10.44
1903	3,735,153.61	333,401,636.79	33,500,000.00	11.15%	1.12%	9.95
1904	3,965,556.96	363,023,704.55	33,500,000.00	11.84%	1.09%	10.84
1905	3,950,294.23	360,514,674.84	33,500,000.00	11.79%	1.10%	10.76
1906	4,060,104.67	385,574,311.39	33,500,000.00	12.12%	1.05%	11.51
1907	4,312,115.90	395,912,000.00	33,500,000.00	12.87%	1.09%	11.82
1908	4,398,787.70	408,335,218.99	33,500,000.00	13.13%	1.08%	12.19
1909	4,372,470.34	406,085,817.95	33,500,000.00	13.05%	1.08%	12.12
1910	4,362,072.04	423,366,869.95	33,500,000.00	13.02%	1.03%	12.64
1911	4,210,073.32	493,774,990.66	33,500,000.00	12.57%	0.85%	14.74
1912	4,208,063.99	586,362,493.07	33,500,000.00	12.56%	0.72%	17.50
1913	4,205,756.71	735,632,510.32	33,500,000.00	12.55%	0.57%	21.96
1914	4,463,588.83	725,446,800.83	33,500,000.00	13.32%	0.62%	21.66
1915	4,898,803.36	913,928,534.01	33,500,000.00	14.62%	0.54%	27.28
1916	5,450,866.00	1,125,648,628.22	33,500,000.00	16.27%	0.48%	33.60
1917	5,780,668.55	1,590,733,339.45	33,500,000.00	17.26%	0.36%	47.48
1918	6,568,914.27	2,483,020,605.15	54,600,000.00	12.03%	0.26%	45.48
1919	7,994,555.30	2,690,469,188.26	55,500,000.00	14.40%	0.30%	48.48
1920	23,971,273.13	3,963,521,338.29	70,000,000.00	34.24%	0.60%	56.62
1921	98,341,283.61	5,107,005,324.22	155,000,000.00	63.45%	1.93%	32.95
1922	102,980,780.54	8,095,503,082.78	240,000,000.00	42.91%	1.27%	33.73
1923	56,758,836.82	10,104,224,035.06	270,000,000.00	21.02%	0.56%	37.42

1924	66,710,168.79	11,080,903,898.31	300,000,000.00	22.24%	0.60%	36.94
1925	78,980,313.18	11,621,735,863.81	330,000,000.00	23.93%	0.68%	35.22
1926	92,668,203.42	11,111,440,888.04	360,000,000.00	25.74%	0.83%	30.87
1927	97,752,199.25	10,142,406,900.33	330,000,000.00	29.62%	0.96%	30.73
1928	88,926,239.17	7,362,310,823.58	1,205,393,789.21	7.38%	1.21%	6.11
1929	100,184,421.39	8,212,332,107.93	1,205,393,789.21	8.31%	1.22%	6.81
1930	112,942,020.19	8,994,604,459.10	1,205,393,789.21	9.37%	1.26%	7.46
1931	119,907,082.59	9,469,912,014.32	1,205,393,789.21	9.95%	1.27%	7.86
1932	78,046,381.36	9,377,194,515.46	1,205,393,789.21	6.47%	0.83%	7.78
1933	86,573,374.33	11,078,251,957.97	1,205,393,789.21	7.18%	0.78%	9.19
1934	93,694,717.78	12,301,262,211.92	1,205,393,789.21	7.77%	0.76%	10.21
1935	93,638,552.21	12,407,027,478.69	1,205,393,789.21	7.77%	0.75%	10.29
1936	123,762,408.31	12,384,618,743.01	1,205,393,789.21	10.27%	1.00%	10.27
1937	123,603,450.44	12,641,311,414.68	1,205,393,789.21	10.25%	0.98%	10.49
1938	113,393,852.29	13,158,427,920.02	1,205,393,789.21	9.41%	0.86%	10.92
1939	84,728,103.87	12,498,885,813.15	1,205,393,789.21	7.03%	0.68%	10.37
1940	88,477,689.94	15,139,022,450.03	1,205,393,789.21	7.34%	0.58%	12.56
1941	89,694,972.46	16,758,612,185.52	1,205,393,789.21	7.44%	0.54%	13.90

Source: Annual Reports of the Governor of the Bank of Greece between 1842 and 1941.

Figure 1

Figure 2

Figure 3

First, the National Bank's return on equity was quite high (i.e. above 20%) during the period 1920-27.⁷ During this period, however, all banks experienced an expansion in their activities due to the great inflow of Greek refugees from the Asia Minor (1922). Moreover, the Bank was the sole issuer of banknotes in these years. As we are going to come across later on, the Bank's high return on equity during this period was primarily caused by the relatively higher financial leverage it employed. On the other hand, the Bank's return on assets appeared rather low

⁷ The Bank's return on equity was higher than 20% for three other years; that is, in 1860-61 and 1883.

for most of this period. The National Bank's return on equity was relatively low (i.e. below 10%) during the periods 1893-99 and 1928-35.⁸ During these periods the following events came about: the country's bankruptcy (1893), the Greek-Turkish war (1897), and the withdrawn of the Bank's issuing privilege (1928).

Second, the National Bank's return on assets was quite high (i.e. above 2%) during the period 1843-89.⁹ On the other hand, the Bank's return on assets was comparatively low (i.e. below 1%) during the periods 1895-99, 1911-1920, 1923-27, and 1932-1941.¹⁰ During these periods the following events took place: the Greek-Turkish war (1897), the merging of the National Bank with the Bank of Epirus and Thessaly (1899), the Balkan Wars (1912-14), and the World War I. It is worth recalling, however, that the National Bank's return on assets is well below 1% currently, as it appears in table I.

Third, the National Bank utilised financial leverage heavily to increase return on equity during the period 1913-27; that is, the leverage multiplier was quite high (i.e. above 20) in these years. This finding suggests that the National Bank was taking higher financial risk from 1913 to 1927. And as we mentioned above leverage improves financial performance of a bank when things are going well, but worsens it when things are going poorly. Nevertheless, during this period there were the Balkan wars (1912-14), the World War I, the Greek-Turkish war (1920-22), and the Bank's exclusive privilege of being the sole issuer of banknotes (1920-28). On the contrary, the National Bank's leverage multiplier was found relatively low (i.e. below 10) during the periods 1842-1904 and 1928-1933.¹¹

5. Conclusions

The aim of this paper is to demonstrate how we can use modern financial tools in the exercise of historical analysis. This exercise is performed by investigating the performance of the biggest Greek bank during the first hundred years of its operation; that is, the period 1842-1941. This task is accomplished by the employment of two profitability measures, the return on equity and the return on assets. In addition, we compute the leverage multiplier of the National Bank for each year of the examined period, to explore the financial leverage used by the Bank to produce the computed return on equity. The main conclusions of the analysis is that the National Bank experienced a quite high (i.e. above 20%) return on equity during the period 1920-27, while its return on assets was quite high (i.e. above 2%) during the period 1843-89. Last but not least, the National Bank utilised financial leverage heavily to increase return on equity during the period 1913-27. The above findings are correlated to a list of historical events without, though, evaluating the effect of these events on the profitability of the National Bank. In consequence, a straightforward and legitimate question could be raised; why and in what way did these events impact upon the financial position of the National Bank? This question should be answered by the future research that will be undertaken by scholars of historical analysis.

References

1. Dertilis, G., (1980), *The Subject of Banks (1871-1873)*, Educational Foundation of the National Bank, Athens, Greece, (in Greek).
2. Eulambio, M. S., (1924), *The National Bank of Greece: A History of the Financial and Economic Evolution of Greece*, G. Vlastos, Athens, Greece.
3. Hellenic Bank Association, (2002), "Greek Banking System Data, Assets and Liabilities of Greek Banks, Greek Banks' Report 2002", www.hba.gr.
4. Houmanidis, L. Th., (2002), *The Evolution of Financial Institutes and Institutions*, Syghroni Epohi, Athens, Greece, (in Greek).
5. Houmanidis, L. Th., (1991), *Economic History of Greece*, Papazisis, Athens, Greece, (in Greek).

⁸ The Bank's return on equity was lower than 10% for six other years; that is, in 1842-44, 1848, 1853, and 1857.

⁹ In 1884 the Bank's return on assets was lower than 2%.

¹⁰ In 1936 the Bank's return on assets was 1%.

¹¹ In 1902 the Bank's leverage multiplier was 10.44.

6. Kostelenos, G. C., D. Vasiliou, E. Kounaris, S. Petmezas, and M. Sfakianakis, (2003), *Gross National Product, 1830-1939*, Research Project, The National Bank of Greece, (in Greek).
7. Kostelenos, G. C., (1995), *Money and Output in Modern Greece: 1858-1938*, Centre for Planning and Economic Research, Athens, Greece.
8. Kostis, K. and V. Tsokopoulos, (1988), *Banks in Greece: 1898-1928*, Papazisis, Athens, Greece, (in Greek).
9. National Bank of Greece, (1842-1941), "Annual Reports of the Governor", *Historical Records of the National Bank of Greece*, Athens, Greece, (in Greek).
10. Pysos G., (1946), *Contribution in the History of Bank of Greece*, Athens, (in Greek).
11. Valaoritis, I. A., (1902), *History of the National Bank of Greece 1842-1902*, National Bank of Greece, Athens, (in Greek).
12. Vasiliou, D., (1999), *Financial Management*, Hellenic Open University, Hellenic Open University, Athens, (in Greek).
13. Vasiliou, D., (1997), "Searching for the Potential Problems of the National Bank", in A. Kintis (ed.), *The Present and the Future of the Greek Economy*, vol. 1, pp. 704-721, Gutenberg, Athens, Greece (in Greek).

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