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WEATHERING THE STORM: THE PERFORMANCE OF THE LARGEST INDUSTRIAL FIRMS IN GREECE DURING THE GREAT DEPRESSION

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Weathering the Storm:
The performance of the largest industrial firms in Greece during the Great Depression

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ABSTRACT

On the basis of a new data set constructed from company balance sheets and profit and loss accounts, this paper examines the performance of the top 50 industrial joint stock companies in Greece which survived the Great Depression. This is the first analysis ever of the financial accounts of big business in Greek industry during this historical period.

Firstly, we examine through descriptive statistics the trends in basic indicators (and ratios for assets, profits, leverage, liquidity, solvency, and efficiency) during the decade 1927-1936. Secondly, on the basis of panel data analysis we test for differences before (1927-1929), during (1930-1933) and after (1934-1936) the crisis and search for those financial characteristics that allowed certain firms within our survivor cohort to perform better than others during the period under review.

The main findings are that: 1) The Great Depression had a rather mild impact on the performance of big business in industry. 2) The level of leverage throughout the period was lower than the one anticipated in other economies and prescribed in theory. For our cohort followed from the beginning a leverage policy which was "as if they were" in a crisis situation. Also, leverage (financial or operating) did not produce the expected benefits (i.e. higher capital investment) even at periods of increasing industrial profits as in the post crisis period. 3) The best performers had high liquidity and made prompt interest payments.

In the last analysis, there was not a reversal in profitability for big business, but the sliding down into labour intensive practices, something enhanced by the import substitution environment cultivated at a time of effective de-globalization.

JEL: C23, G01, M41, N64.

Key words: Greece, big industry, joint stock companies, survivors, financial statements, business performance, leverage, panel data analysis.

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Weathering the Storm:
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1. AIM

In this paper we examine in detail the performance of the top 50 industrial Societé Anonymes companies which weathered the storm of the Great Depression. The Societé Anomyme (henceforth SA) company in Greece is the equivalent of the joint-stock company in the Anglo-Saxon world. This paper is part of a wider project at AUEB, that creates new historical data bases on the evolution of the Greek corporate sector from national independence onwards. Up to now the focus has exclusively been on the construction of data bases on incorporation- company births. (See: www.aueb.gr/users/ipepelasis/jsc/index.htm) This project embraces quantitative analysis, following an emerging trend in the literature that places statistical, econometric and historical analysis "on the same footing", with history having the final word in the interpretation of results. (Fusari and Reati, 2013).

[4] This paper has been presented at the Economic History Session (organized by Ioanna Sapfo Pepelasis and Anna Spadavecchia) of the 27th annual EAEPE Conference, Genoa, 17-19 September 2015. The construction of the data base was made possible as a result of funding from the EU basic research funding at AUEB (PEVE 3). We thank Yannis Agathangelos, Christina Sofianou and Iphigeneia Chatzantonis for research assistance. We also thank Kostas Axarloglou, Aimalia Protogerou, Anna Spadavecchia, and for their useful comments. Special Thanks to Ilias Tzavalis,Thanos Sakkas and Mara Vidali for their comments and advice on the econometric tests and results.
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This paper is the first analysis ever of the financial accounts of big business in industry during the Great Depression. We have constructed a new data base for the decade 1927-1936 from the company balance sheets and profit and loss account of the top 50 industrial SAs which survived the crisis. To this statistical material we address the following questions:

-What were the trends in business performance and basic financial indicators for our cohort of firms before, during and after the Great Depression?

-What were those financial characteristics that allowed certain firms within our cohort to perform better than others during the decade under review?

-What were the specific historical circumstances that led our cohort group to deviate from the prescriptions of theory?

From this point onwards the paper is organized as follows: Section 2 is a review of the literature. Section 3 presents in a nutshell the Greek interwar economy. Section 4 discusses the data base and methodology. Section 5 outlines the relative position/size of our cohort in the non-financial corporate sector in 1929 -the selection year for our top 50 firms. Section 6 analyses the trends for selected business performance and financial indicators/ key ratios of our cohort over 1927-1936. Section 7 presents our econometric panel data analysis of our selected indicators. Section 8 offers on the basis of historical evidence explanations as to why there were certain deviations from theory. Section 9 sums up the main findings.

2. LITERATURE REVIEW AND OUR CONTRIBUTION

The literature on the subject of the Great Depression in Greece has addressed macroeconomic aspects in finance, foreign trade, banking, agriculture, and industry. (Mazower, 1991; Kostis, 1986; Christodoulaki, 2001; Dritsas, 1990; Christodoulakis, 2011). What is missing, is the quantitative study of firm performance based on company accounts. Our measurement of business performance contributes towards covering this gap. In fact, accounting history is on the whole an unknown field in Greece and little used in business history research. The only attempt we are aware of at aggregate statistical analysis of company balance sheets-but using only two financial indicators and with no econometrics- is that of Tsotsoros (1993) in his statistical work on the formation of capital in Greek industry between 1898 and 1939.In addition our

paper is relevant to research on the history of the joint stock company in Greece, a topic pioneered by Angelopoulos, (1928).

Regarding the international literature, our work draws on various themes. Primary is the issue of how to gauge past business performance (Boyce and Ville, 2002; Chandler, Amatori, Hikino, 1997). In this paper we have given special attention to the historical work of Cassis on big business, while also using standard measurements present in accounting theory (Cassis, 1997; Hilton; 1999). Another relevant theme is the analysis of the relation between business performance and key financial indicators. It is well known that the first seminal work in this direction was that of Modigliani Miller (1958). Within this framework, the main studies of significance for our endeavour are: Graham and Narasimhan (2011) and Brealey R., Myers S., and Allen, (2008). The first study analyses company performance during the Great Depression in the USA. It uses 1927 as a benchmark year and in specific examines whether the level of debt and operating leverage of companies in that year affected the occurrence of financial distress for companies during the Great Depression. The assumption being that a high level of leverage at that date affected negatively business performance during the depression. While Brealey R., Myers S., and Allen (2007) describe the conventional perception that in good times those firms that perform better are those that have high leverage due to the economies of scale they enjoy at financial/operating level. Whereas during bad times, the less affected are those that have low leverage as they avoid the burden of the fixed cost associated with high financial and operating commitment. Among others who have used this framework is the article of Asgharian, (2003) which examines the sensitivity of highly leveraged firms to economic downturns.

Other themes of significance, albeit indirectly to our study, are :1) Porter (1990)which brings up the issue of market orientation of business/ trade regimes and how they affect competitiveness. 2) Recent work on the impact of the recent crisis. For example, Notta and Vlachvei (2014) on the performance of food manufacturing firms before and during the recent economic crisis in Greece.

In our analysis, we have been selective in our approach and have made adaptations as a result of differences in data availability (to be expected) given the differing levels of economic development and maturity of the capital markets between interwar

Greece on the one hand and advanced economies, or contemporary Greece on the other hand.

3. BRIEF PRESENATION OF THE INTERWAR ECONOMY AND GREAT DEPRESSION IN GREECE

Following WWI, Greece embarked on a costly and unsuccessful military campaign in Asia Minor (1919-1922). Upon defeat in 1922 there was an influx of over 1,000,000 destitute refugees. (Clogg, 1994) The sudden increase in population in a poor country of barely 5,000,000 people, moved outwardly the Production Possibility Frontier of Greece, enhancing the supply of human capital. The refugee population was a cheap pool of labour and simultaneously high in business expertise. It has been generally perceived in the literature that the refugee influx acted as an exogenous shock which mobilized (and or made pressing the need for) institutional reforms such as for example, a radical land redistribution program in 1923/4 and the 1927/8/League of Nations stabilization plan and banking reform (Franghiadis, 2007, Pepelasis Minoglou,1993; Pepelasis and Aivalis,2014). Although the refugee influx's immediate impact on economic growth is contested, the fact remains that Greece in the interwar period experienced a substantial rise in the pace of industrialization [8] (Louri and Pepelasis Minoglou, 2002) and economic growth. Retrospective GDP estimates reveal a rise in per capita income in constant 1914 prices from 245,9 drachmas in 1922 to 363,8 drachmas in 1938. The rise in the index of real GDP growth (1910=100) was even larger. It increased from 198 in 1922 to a peak of 347 in 1938. (Kostelenos et al, 2007). [9]

Regarding the Great Depression - it is well known, that its economic impact varied and that among the developing countries those that suffered most were the exporters and those that had tight links with the international economy.[10] (Eichengreen,2014; Hobsbawm,1997). For Greece (neither a net exporter, nor an internationalized economy) the Depression was both brief and had a rather mild impact on GDP for interna-

[8] For a first hand chronology of how the world of industry changes in Greece as the time see: Anastasopoulos (1946) Volume: 3.

[9] For an analysis of economic growth from a historical and political economy perspective, see: Dertilis, (2011); Franghiadis, (2007).

[10] The dating of the great depression is not fixed in the international literature. For some scholars it lasted from 1929-1933, for others 1931-1933, or 1931-1936 and finally some in the most recent literature consider the whole interwar period as a period of a crisis that terminated with the end of WWII.

tional standards [11] (Mazower, 1991, Psalidopoulos,2011). Real GDP per capita index dropped for only for two years: 1931 and 1932: from 110 in 1930 it contracted to 103 in 1932. This was a lower and briefer drop compared to world GDP (Eichengreen, 2014) The post crisis so to speak recovery was impressive: in 1938 GDP per capita index increased to 123. (Kostelenos et al, 2007)[12]

4. DATA BASE CONSTRUCTION AND METHODOLOGY

4.1. Firm selection –preliminary 1929 data base

We initially constructed a first data base/excel based on the balance sheets and profit and loss accounts published in the Greek Government Gazette in 1930 by non-financial SA firms for the year 1929. We chose 1929 as a benchmark year because it was the emblematic year of the Wall Street Crash and because it was the peak year in total industrial output in Greece before the Great Depression, according to the most recent quantitative research on the topic (Christodoulaki,2001) . From this initial 400 group we detected the 227 industrial companies that published their accounts for 1929. From this subset we further narrowed our sample to the top 50 on the basis of asset value and under the condition that they survived the Great Depression- namely that these companies continued to publish financial accounts in the Greek Government Gazette up to the end of the period under study.

4.2. Top 50 data base (1927-1936): periodization

In order to gauge the impact of the Great Depression, this sample contains information on the financial accounts of the top 50 industrial SA firms overs the decade 1927-1936. The latter is divided in three sub-periods: before (1927-1929), during (1930-1932) and post- crisis (1933-1936). The crisis period has been selected on the basis of Christodoulaki's classification for total industrial output in Greece (2001).

[11]In Italy the drop in GDP lasted two years (1931 and 1932), in Spain two years also (1931 and 1932) and in Portugal one year(1930). Moreover, the percentage drop was less pronounced in these countries and Greece compared to industrial countries in general (Kostelenos, et al).

[12]Regarding the index of real GDP growth, it contracted from 262 in 1930 to 252 in 1932. At 342 in 1938 it was far above the value for 1930.

4.3. Constraints in building top 50 data base

The problems we experienced were multiple and concerned all stages of research: the collection of raw data (balance sheets and profit and loss accounts); the classification of the information provided there in and the compilation of ratios/meta-data. There was a lack of a coherent accounting reporting system in Greece and a first basic obstacle was that financial statements per company did not appear every year. Whether this was a case of the companies neglecting/forgetting to publish their outcomes for some 'good reason' or bureaucratic omission on the part of Government Gazette we cannot know. In order to surpass this technical difficulty- and to have for every year on average fifty firms- we have included in our 'top fifty industrial sample' 54 firms.

Another problem was that in the balance sheets often some parameters were missing. Law 2190/1920 which oversaw the corporate sector was very incomplete regarding both the content of the entries of the balance sheets and the structure of the balance sheets. In fact, in Greece a National Association of Accountants was founded in 1958 and no unified system for accounting was introduced before 1991 (EEC Directive 91/674)!

Thus, in the period under review no standard rules were employed in the balance sheets and profit and loss accounts: For some variables, such as depreciation for example, the highest number of companies in our sample of 54 which entered data per annum was only 44! (this was in 1929). In addition, not only did different accountants use different methods in presenting the financial situation of a company, but also the same company would often over time be inconsistent in how it presented/organised the various entries in the balance sheet. Moreover, there was a general vagueness with regard to the magnitude of 'sales'. We would like to provide here three examples of erratic method of presentation, inconsistencies and lack of clarity.

1. In the balance sheet of a company, in the entry 'fixed assets' for one year x, the entry for depreciation would state: 'compiled depreciation for over a number of years' and in the following year (x+1) the entry for fixed assets would present depreciation for only the specific year.

2. In the section asset liabilities, a liability to banks might appear, but in the profit and loss accounts there would be no interest paid. Moreover, in the some cases the reverse would hold.

3. In the profit and losses accounts a part of revenues are in some cases referred to as gross profits and in other cases as profits from goods sold. Since it was impossible to differentiate we treated them as gross profits.

In the regression analysis phase, one more difficulty arose with the data base. For four companies there was a problem regarding the variable of gross fixed asset. In each case for 1 or up to 3 years the values were outliers and had an extreme variation either upward or downwards. In one case, that of the 'Flour mills of Saint George', this problem appeared in 1929 and this was because up till then the company lay dormant, I.e. this was the true first year of its operation. Thus, we have kept the outlier. However, in the three other cases, no explanation could be found other than the fact that they either purchased property and machinery - which was then sold, or that the opposite was the case, I.e. That they sold and purchased property and machinery. In the latter three outliers we have trimmed the values. Also, in some companies for specific years, there were missing numbers for the variables we are studying. In such cases for the purposes of our regression analyses, the gaps were treated as missing values.

Finally, another problem we have faced is that the retrospective price index /deflator constructed by Kostelenos, et al. (2007) is heavily based on a basket of agricultural goods and hence it is not useful for us as we are examining only industrial firms. Although we have also used 1914 constant drachmas in our estimations of the variables we must take into consideration this weakness.

4.4. Variables listed per firm in the top 50 data base

The total list of variables per company in our top 50 industrial survivors data base can be classified into non-financial and financial indicators. Non-financial indicators were: date of incorporation and sector. Regarding incorporation dates we observe that all of the top 50 companies were relatively young in age. All were founded in the twentieth century; the earliest date being 1906 for the 'Hellenic SA of Wine and Distilled Alcohol'. About half were founded in the 1920s. Actually, four companies were founded in 1928-one year after the starting point of our data base. Regarding sectoral composition, the top 50 data base was basically populated by the traditional mainstay of Greek industry and its fastest growing sector at the time: Sector 2. Sectors (1) and (4) were also prominent in the top 50. (See Table 1 below) These were two areas

which were also developing fastly in interwar Greece. (Economic Yearbook for 1939; Christodoulaki, 2001).

For the financial indicators (over 20 in number) listed in the data base ,see Appendix Part 1 .

TABLE 1

SECTORAL COMPOSITION OF TOP 50

Sector 1	Clothing, shoes, textiles
Sector 2	Food, beverages and tobacco
Sector 3	Electric power, natural gas, coal mining
Sector 4	Minerals, cement, construction
Sector 5	Others (chemical, paper, etc).

4.5. Variables and ratios (meta-data) employed in the analysis

For the measurement of business performance we employ the following indicators: assets and net profits, and as a proxy for profitability we have also used the ratio: cash/total assets (CFA).

For the analysis of financial determinants we construct the following ratios: Operating leverage (ATR); Debt leverage (TDE); Liquidity (CUR); Solvency (TIE); Efficiency ratio (GPCA).Given the limitation of our data set we also use proxies for each of the financial indicators.

As an approximation to operating leverage (ATR) we use the ratio of fixed over total assets. As an indicator of debt leverage (TDE) we use the ratio of total liabilities over total assets. The reason we use total liabilities is that the data set does not allow for a clear distinction between operating liabilities and interest-bearing forms of debt. For liquidity (CUR) the indicator we employ is current assets over current liabilities, known as current ratio. Solvency or 'Times Interest Earned' ratio (TIE) is measured here as operating profit before interest/interest paid. For efficiency (GPCA) we use as a proxy the ratio of gross profit over current assets.

In conclusion, we have adjusted all the business performance and financial indicator ratios employed to the constraints posed by our data base. Before embarking on our analysis of their dynamics for 1927-1936, we take below a snapshot of the position – in terms of assets- of industry and the top 50 firms in the corporate world of Greece on the eve of the Great Depression.

5. PRELIMINARY SNAPSHOT. BENCHMARK YEAR 1929: ASSET VALUES FOR NON-FINANCIAL, INDUSTRIAL AND OUR TOP 50 SA FIRMS

5.1. The 400 non-financial SA firms

In 1930, 400 non-financial SA firms published their financial accounts for the previous year. The company with the largest capital (asset value) was the public works consortium for electricity and other public goods, the 'General Hellenic Company'. The smallest company was the 'SA National Wealth'. The sample was so skewed that the average capital per company was three times over the median and over 300 companies had capital below the average! Notably, the top five companies had a capital that was slightly over one fourth of the total capital of the 400 non-financial SA companies that published their balance sheets in 1930. Industry was predominant in this group as four of the top five firms, were located in this sector.

5.2. The 227 industrial SA firms and the top 50 group

Among the 400 non-financial SAs that published a balance sheet in 1930, 227 were industrial companies. The assets of the latter amounted to two thirds of the 400 total. Industrial firms were on the whole larger than other types of firms in this wider group. The smallest industrial SA, The 'Greek Company of Diluted Acetyline' had almost triple the size of capital of 'The SA National Wealth', the company which as mentioned above was at the bottom of the list for all 400 companies. However, although the 227 industrial companies were relatively large compared to firms in other sectors, it was the case also that within this group under one fourth of the total industrial SAs had total assets above the average.

As for the top 50 group within industry, they represented big business and nearly all firms were listed on the Athens stock exchange.[13] The 50th in ranking industrial firm, the ' SA Industrial Firm Mac Andrews and Forbes' had over 100 times larger assets

[13] The Athens Stock Exchange was at the time however a shallow institution. At this stage it is not possible to have a detailed work on capitalization. We are looking forward to the publication of the study of Michalis Riginos on the evolution of the Athens Stock Exchange. For the time being we thank him for his oral information on our companies and for his seminar: Riginos (2015).

than the SA at the bottom of the 227 industrial list, which as already mentioned above was the 'Greek Company of Diluted Acetyline'.

TABLE 2
ASSETS IN 1929 OF NON-FINANCIAL FIRMS
(IN CURRENT DRACHMAS)

	Total sample of 400	Industrial sample 227	Industrial sample of top 50
Mean	32.279.218,32	36.173.934,76	83.359.432,13
Median	11.217.452,95	14.415.838,85	52.508.729,00
Largest firm	3.152.791.11.5	248.738.486	248.738.486
Smallest firm	114.000,00	285.163,10	25.136.285
Total assets	129.116.87329,16	8.211.483.191,26	4.334.690.471

In sum, this statistical snapshot of our preliminary data base portrays the significance of industry and its top 50 firms in the non-financial corporate sector on the eve of the Great Depression.

6. DECADE TRENDS (1927-1936) IN BUSINESS PERFORMANCE AND KEY FINANCIAL DETERMINANTS FOR THE TOP 50 INDUSTRIAL SAs

Our first step in the analysis of the top 50 data base was to follow statistical rends over the decade 1927-1936 for business performance and key financial determinants. The indicators selected are those employed also in the econometric panel data analysis in Section 7. All of the values mentioned in currency from this point onwards are in constant 1914 drachmas. For the analysis of each of the indicators we follow three steps: 1)We start with a comparison of the values for 1927 and 1935, two years for which balance sheets exist for 49 of our companies. We would have preferred 1936 to 1935, but there are many missing values for this final year of our decade under review. 2) We follow trends from 1927 to 1935, (or 1936 when the latter does not present outlier values), and detect if there was a marked change in trends during the crisis years (1930-1932). 3) We observe the dates for the nadir (lowest) and peak values.

6.1 Business Performance

As already mentioned, in order to measure the business performance of our cohort we have chosen: assets, net profits, and the ratio net cash flow over total assets (CFA).

1. Assets (Total, Mean, Median)

Total assets. In 1935 they were roughly 60% higher than the amount registered in 1927. For this indicator only we do not follow annual trends throughout the decade - as there was a varying number of balance sheets published each year. Thus instead- we opted to examine the annual trends in the mean and medians of firms. What has this investigation revealed ?:

Firstly, in 1935 the mean value was 54% higher and the median 47% compared to 1927 .

Secondly, throughout the period under review the median values fluctuated between 56% and 65% of the mean values, with the exception of 1936 when it dropped by a large margin, but most likely outlier value due to smallness of sample for that year.

Thirdly, during the crisis period only in one year was there a fall in values – 1932 for the mean and 1931 for the median. In fact, the second highest value for the mean was in 1931 [14] and for the median the peak was in 1930. However, for both indicators the nadir value was in 1933.

Apparently the impact of the Great Depression on the assets of big industry was mild and although it ended in 1933 (i.e, one year after the end of the crisis period for industry as a whole) it did not involve a fall in values for all three crisis years (1930-1932). Neither, as can be judged from the ratios of median over mean values, did the Great Depression seem to have an immediate and strong impact towards a higher concentration of capital,

TABLE 3
MEAN AND MEDIAN ASSETS FOR TOP 50, 1927-1936 (IN CONSTANT 1914 PRICES)

Year	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936
Mean	3,199,460	3,702,439	4,662,161	4,769,839	**5,055,252**	4,822,063	**4,520,140**	4,572,957	4,805,657	**6,602,085**
Median	2,064,805	2,119,005	2,936,730	**3,156,634**	2,880,092	3,146,686	**2,798,973**	2,906,215	3,094,329	3,093,376
Median as a % of Mean	65%	57%	63%	**66%**	56%	65%	60%	65%	62.5%	**46%**

Note: Red denotes decline. Bold red is nadir. Green is peak. In those cases that the peak is in 1936, we have added a second peak, as this year was non-representative.

[14] The peak was in 1936, but most likely this was an outlier value due to smallness of sample.

2. Net Profits

Turning to total net profits: in 1935 they were about 30 % higher compared to 1927. Because it is pointless again to examine the overall trend we now focus on mean and median trends. What do we observe?

There was an overall significant increase in profits which seems to have become over time more evenly allocated among firms.

Mean value in 1935 was nearly double that of 1927. In the crisis period only in one year was there a drop in value and the nadir was in 1929.[15]The highest value was registered in 1936 (and the second highest in 1934).

Turning to median assets, the values were consistently lower than for the mean. In 1935 the median value of net profits was twice as high compared to 1927 as was the case with the mean value. During the crisis period there was a fall in median profits in two years. The lowest value was registered in 1928 and the highest value was registered in 1936 and 1935. The track record of median profits was rather spectacular in the post crisis period compared to the pre-crisis period. Perhaps the fact that the economy became less open (See Section 8) allowed smaller firms within our sample to 'thrive' in terms of profits.

TABLE 4
NET PROFITS FOR TOP 50, 1927-1936
(IN CONSTANT 1914 PRICES)
Note: Red denotes decline. Bold red is nadir. Green is peak.

	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936
Mean	1.409.053	1.341.585	**490.550**	1.742.142	1.281.567	1.373.598	1.811.063	**2.175.599**	2.058.551	**2.828.159**
Median	835.977	**670.948**	666.847	879.708	824.835	762.672	1.230.109	1.370.392	**1.601.084**	**2.068.274**
Median as a % of Mean	57%	46%	**134%**	**50%**	64%	55%	68%	63%	77%	73%

3. Cash flow /total assets (CFA)

The CFA ratio followed a rising trend and in 1935 was almost triple the size OF 1927. During the crisis period, this ratio fell only in one year. The lowest value was in 1929

[15]This was mostly due to widening losses suffered by two agricultural processing industries 'Hellenic Agriculture' and 'Industrial Olive Oil of Corfu'.

and the highest in 1935. The post crisis period registered faster growth, compared to pre-crisis period. (See TABLE 5 below).

6.2. Values of the key ratios- financial determinants in our 50 firm sample

For a presentation of the values of key financial ratios see again TABLE 5 above. Our main observations regarding the trends of these determinants are:

1. Operating Leverage (ATR). There was a falling trend. The nadir was in 1936 and 1935. The peak year was 1927. During the crisis period there was a decline in two out of the three years. The sharpest decline was in the post crisis years.

TABLE 5

MEAN VALUES OF SELECTED RATIOS FOR TOP 50, 1927-1936

YEAR	CASH FLOW/TOTAL ASSETS (CFA)	NET FIXED ASSETS/TOTAL ASSETS (ATR)	TOTAL LIABILITIES / TOTAL ASSETS(TDE)	CURENT ASSETS / TOTAL CURRENT ASSETS (CUR)	NET PROFIT + INTEREST) / INTEREST (TIE)	GROSS PROFIT / CURRENT ASSETS (GPCA)
1927	0,1278	0,4302	**0,4927**	**1,3877**	**4,8927**	**0,3937**
1928	0,1299	0,4221	0,5043	1,4295	2,9125	0,3231
1929	**0,1071**	0,4231	0,5652	**1,3527**	2,3709	0,3204
1930	0,1444	0,4162	0,5530	1,5158	2,6434	**0,2818**
1931	0,1414	0,4252	0,5477	1,4265	1,2310	0,2525
1932	0,2030	0,4031	0,5362	1,5547	1,9368	0,3556
1933	0,2040	0,4144	0,5359	1,6510	1,7540	0,3283
1934	0,2423	0,3894	0,5228	**1,7899**	2,8679	0,3709
1935	**0,2830**	0,3713	0,5609	1,7082	3,3444	0,3417
1936	0,2355	**0,3190**	**0,6042**	1,4630	1,5861	0,3129

Note: Red denotes decline. Bold red is nadir. Green is peak.

2. Debt Leverage (TDE). The bottom year was 1927 and 1929 was the peak year. During the crisis there was a falling trend which continued up to 1934 inclusive.

3 .Liquidity(CUR). In general theory suggests that this ratio should be above 1 to indicate a healthy level of liquidity, (Hilton, 1999). The top 50 industrial SA companies in Greece experienced a healthy level of liquidity. There was a rising trend especially during 1932-1934. The bottom year was 1927 and the peak year was 1934.

4. Solvency (TIE) .There was a falling trend. The highest value was in 1927 and the lowest in 1936.

5. Efficiency ratio (GPCA).There was a falling trend. The highest value was in 1927 and the lowest in 1931. This ratio showed a partial recovery in the post crisis period.

6.3. Discussion of findings for business performance and financial characteristics

6.3.1. Business performance

Our top 50 firms were expanding in size and profits. This was in concurrence with the expansion of Greek industry as a whole. For a first attempt at a juxtaposition of our figures for the business performance of our top fifty and expansion in total industrial output in Greece, see: Appendix, Part 1.

Notably, although there was some decline in performance during the crisis years, it is the case that: the nadir/trough year was located before the crisis and the downturn during the crisis was mild. Where does this place our findings with regard to the wider literature on the impact of the Great Depression on industry as a sector? The latter is divided in so to speak in two strands of thought. Some argue that the Great Depression did not seriously affect industry (Kostis, 1986,1987,1992; Mazower,1991) and that the drop in industrial production was only for 1932. Whereas Olga Christodoulaki (2001) demonstrates through new indices that the Great Depression affected Greek industry through a fall in output for three consecutive years (1930-1932). Our finding is somewhere in between as for each of our performance indicators the drop varied in dates within the crisis period, but was never for more than two years.

In the post-crisis years the rise in profitability /performance was higher than before. [16]This finding is more or less in agreement with the wider perception in the literature on Greek industry at a macro level, that expansion was more pronounced in this phase of rising protectionism [17] (Economic Yearbook for 1939); Kostis (1986,1987,1992).

It is interesting, that the crisis did not lead to a higher concentration of assets among firms within our sample. This perhaps also is related to the fact that the economy was

[16] For mean and median assets however, the rise started one year later than for net profits and CFA.
[17] For the argument of fast growth also in 1920s see: Mazower (1991) and: Christodoulaki (2001).

less open in the 1930s which probably allowed smaller firms within our sample to 'thrive' in terms of profits . (See also Section 8 below)

6.3.2. Financial indicators

1. Operating leverage. Given the growth in profitability (shown in 6.1.) post-crisis, the decline in operating leverage implies that companies made more use of labour instead of capital to expand. This can be explained by the environment (See also Section 8)

2.Debt leverage. The biggest firms within the sample had privileged access to funding. This is based on the following two observations: 1) Regarding the debt leverage ratio the top 10 firms had much higher ratio than the rest of the sample; 2) Regarding the liquidity ratio, the bottom 10 did substantially better from 1932 onwards compared to top 10 and whole sample. I.e we can assume that they did not have the power to receive more credit from suppliers and banks. (See Appendix Part 2. for top and bottom 10)

3. Liquidity ratio. All sectors followed generally the same trends with the exception of Sector 3(electricity) which had the lowest ratios except for the liquidity ratio in which case it was much higher. This unique deviation can probably be explained by the high level of foreign capital inflow in the largest firms in this sector (Pepelasis Minoglou, 2002).

4. Solvency ratio. The ratio was affected by net profits and shifts in interest rates. (50 years of Bank of Greece, 147). It is worth noting that there was a decrease in the solvency ratio when interest rates increased but that also the fall in the discount rate post 1932 did not provoke a rise…which was peculiar as net profits were rising. Hence, we can assume that even during the good times, industrialists were hesitant to borrow. (See Section 8)

5. Efficiency ratio (GPCA).This ratio was sensitive to the falling profitability of companies during the period 1927-1932.

The year in which the top 50 had the highest number of 'values in red' (i.e. decline) was 1931. This was the year the gold exchange standard collapsed.

In a nutshell. The top 50 firms had a healthy liquidity as to be expected by theory. However, as is not expected by theory, the top 50 laboured as if they were in a crisis

situation throughout the period under review. Now we test for this core observation and the causality between financial determinants and business performance in our panel data analysis.

7. METHOD AND EMPIRICAL FINDINGS

7.1. Method

To estimate the relationship between the business performance and financial factors and test the differences during the period under investigation, we use the following panel regression model:

$$CFA_i = \alpha_i + \beta_1 ATR_i + \beta_2 TDE_i + \beta_3 CUR_i + \beta_4 TIE_i + \beta_5 GPCA_i + u_i$$

where *i* refers to a firm which belongs to the top 50 firms, CFA_i refers to net income plus depreciation (cash flow) over total assets of firm *i*, ATR_i refers to operating leverage of firm *I*, TDE_i refers to debt leverage of firm *i*, CUR_i refers to liquidity of firm *i*, TIE_i refers to times interest earned ratio of firm *I*, $GPCA_i$ refers to asset efficiency of firm *I*, and u_i is a normally distributed random variable disturbance term.

Two main approaches to the fitting of models using panel data are known as fixed effects and random effects. The fixed effects approach is more attractive to this case to estimate the panel regression model since the estimates are consistent without making any assumption about the individual effect α_i. Hence, the chosen approach is agnostic about the nature of the individual effect.

7.2. Empirical findings

The main argument is that the higher the CFA of a firm the better its performance and the greater the distance from bankruptcy. Classic economic theory predicts that in lean times when demand is low, a firm's performance will be negatively related to operating leverage, as well as to debt leverage. On the other hand, a healthy firm is supposed to have high liquidity and show high levels of solvency and efficiency.

7.2.1. Fixed effects model

Based on data base during 1927-1936 data base and given the limitations of our data base-in detail in section 4.2.1. (Ross et al. (2013), the results are the following:

TABLE 6

RESULTS OF PANEL REGRESSION

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A	0.325351	0.066289	4.908093	0.0000
ATR	-0.439977	0.078966	-5.571702	0.0000
TDE	-0.159600	0.062303	-2.561694	0.0111
CUR	0.037381	0.010507	3.557620	0.0005
TIE	0.004553	0.002236	2.036638	0.0430
GPCA	0.192985	0.033571	5.748489	0.0000
R-squared	0.844746	Mean dependent variance		0.177547
Adjusted R-squared	0.812938	SD dependent variance		0.188192
SE of regression	0.081394	Akaike info criterion		-2.022670
Sum squared residual	1.358128	Schwarz criterion		-1.413487
Log likelihood	293.8111	Hannan-Quinn criterion		-1.777436
F-statistic	26.55758	Durbin-Watson statistic		0.941727
Prob(F-statistic)	0.000000			

Therefore, we verify the alternative hypotheses since all the coefficients of the explanatory variables are statistically significant (t-statistic>1.96 and >2.57 for 5% and 1% level of significance, respectively).

Checking for multi-collinearity, we provide the correlation matrix (see Appendix, Part 3). Recall that correlation between explanatory variables should be relatively low and any correlation coefficient of 0.60 or above creates unacceptable bias of multi-collinearity. The highest value of the test is 0.43. Hence, we can conclude that multi-collinearity is not present in the regressions.

Moreover, unit root tests were made in each variable in order to test whether it is non-stationary. Under the null hypothesis, the variable has a unit root i.e. it is non-stationary. The null hypothesis is rejected for all variables since all p-values produced are zero (see Appendix, Part 4).

These results are consistent with the predictions of financial management theory on liquidity, solvency and efficiency. The estimated coefficients of these aforementioned variables are positive and statistically significant. In other words, among the top-50 Greek industrial firms operating between 1927 and 1936, the best performers, in terms of cash-flow earned, were characterized by high liquidity, ability to make prompt interest payments and utilizing their current assets profitably.

Financial theory suggests that the impact of operating leverage and debt leverage will be positive under favourable market conditions on cash flow, unless the industry shrinks (as it did between 1930 and 1932). However, the coefficients of both leverages were found to be negative and statistically significant throughout the period 1927-1936.

7.3. Sub-sample analysis: Different time periods

In order to investigate the impact of operating and debt leverages under different states of the Greek economy, we conducted a sub-sample analysis through a series of regressions at different time periods. This analysis concerns alternative scenarios during pre and post crisis years with references to the developments in Greek industrial output. As we have discussed above, the research of Christodoulaki (2001) shows that Greek industrial output declined only in the three year period 1930-1932. Hence, we devised Scenarios 1 and 2 in which the period 1927-1936 is distinguished in three or two sub-periods respectively.

Scenario 1: Pre crisis = 1927, 1928, 1929
Crisis = 1930, 1931, 1932
Post crisis = 1933, 1934, 1935, 1936

Scenario 2: Crisis years = 1930, 1931, 1932
Normal years = 1927, 1928, 1929, 1933, 1934, 1935, 1936

Moreover, trying to capture the influence of our basic variables on cash flow under different exchange rate regimes, we distinguished between the period before the 1932 devaluation of the Greek Drachma and the period after it. Thus:

Scenario 3: Pre Drachma devaluation years = 1927, 1928, 1929, 1930, 1931
Post Drachma devaluation years = 1932, 1933, 1934, 1935, 1936

The results of the sub sample analysis are summarized in the table below:

TABLE 7

SUBSAMPLE ANALYSIS: TIME PERIODS

	Period	ATR	TDE	CUR	TIE	GPCA
Total sample	1927 to 1936	-**	-**	+**	+*	+**
Scenario 1	1927-1928-1929	-**	-**	-	+**	+*
	1930-1931-1932	-**	-	-	-	+**
	1933-1934-1935-1936	-	-**	-	+**	+
Scenario 2	1930-1931-1932	-**	-	-	-	+**
	1927-1928-1929-1933-1934-1935-1936	-**	-*	+**	+	+**
Scenario 3	1927-1928-1929-1930-1931	-	-	+**	+**	+*
	1932-1933-1934-1935-1936	-	-**	-	+**	+

Note: * and ** denote significance at the 5% and at 1% levels, respectively.

7.4. Results

All scenarios examined show that in all sub periods, there is a negative effect of operating and debt leverage on the financial performance of firms. It is worth noting that there is not even one positive coefficient (significant or not) referring to operating or debt leverage.

Regarding liquidity, we note that there are only positive statistically significant coefficients for sub-periods examined. This finding supports our assumption that high liquidity is associated with sound financial position of firms.

Similar findings are produced by the sub-sample analysis of TIE and GPCA, confirming our initial panel regression results. Both of these explanatory variables do not present any significant negative coefficient.

The estimated coefficients of operating and financial leverage are negative regardless the examined sub-period or sub-sector. Hence, it seems that firms in our sample operate continually and in all sectors as if they were facing adverse market conditions. In

other words, heavy borrowing and high capital intensity affect negatively business performance, consistently over the years 1927-1936 and across sectors.

8. EXPLAINING THE 'DEVIATIONS' FROM STANDARD THEORY

In this Section we turn to the historical concurrence in order to explain the two main deviations from theory noted in our findings (Sections 6.1.1; 6.2. and 7), namely:
Firstly, why the level of leverage throughout the period was lower than the one anticipated in other economies and prescribed in theory?
Secondly, why leverage (financial or operating) did not produce the expected benefits (i.e. higher capital investment) even at periods of increasing industrial profits as in the post crisis period?
For the first deviation. What helps explain why the firms had a lower leverage than expected is that in spite of the rather high rate of GDP growth, the whole interwar era was in a sense one of a 'crisis environment' for the Greek economy: At first there was the economic set back of the long war decade (1912-1922). Then there was the shock of the refugees influx which at least in the short run created further dislocation in the economy -a pressing fiscal burden for the state of having to accommodate and provide the means for their livelihood. Moreover, another important factor was that throughout the period there was the problem of high interest rates and capital shortage (Psalidopoulos, 2011; Bank of Greece, 1978) The latter was made even worse as a result of two consequences of the Great Depression in 1931/2: the breakdown of the Gold exchange standard system and the abrupt ending of large foreign capital inflows in 1931/2. (Pepelasis Minoglou, 1993)
The second deviation can be explained again by high interest rates, in combination with the fact that real wages were particularly low -and even purposefully held down by policy after 1932-- which made capital investment scarce as the latter became comparatively more expensive in relation to the price of labour. It is helpful here to note that real average wages of workers were increasing at a lower pace than the price level throughout from 1921 up to at least 1936 (Riginos,1986). Moreover, industry was geared towards the domestic market (import substitution) and not export oriented. This basic feature became even more prominent in the 1930s with the breakdown of global trade.

High protectionism became first evident with the introduction of a new tariff regime in 1923 and 1926. At the same time local industry acquired benefits from other measures such as for example, the introduction of public procurement for locally produced goods and tax reliefs and the lifting of import duties on raw materials. The last measure however as well as tax relief on machinery and equipment not produced in Greece was cancelled during the crisis. This, in combination with keeping the drachma undervalued post 1932, resulted in an ossification of mechanical equipment in Greek industry. (Pepelasis Minoglou, 1999)

Expansion through the small and disarticulated local market led to low competitiveness. Greek industry was localised due to transportation problems, poor infrastructure and non-existent logistics. What was lacking was the dynamic innovation inducing environment of the global markets. This seems to support the Porterian proposition that if local firms do not compete internationally in the last analysis they are not efficient even at home, .as you cannot have a locally efficient market. (Porter, 1990).

9. GENERAL CONCLUSION

This first study of SA balance sheets throughout 1927-1936 shows that the Great Depression had a rather mild impact on the performance of big business in industry.

In terms of business strategy, throughout the decade under review, our cohort of the top 50 survivors, followed a leverage policy which was " as if they were in a crisis situation". The best performers had high liquidity and made prompt interest payments. It is noteworthy that leverage (financial or operating) could not produce the expected benefits even when there was increasing income. In the last analysis, there was not a reversal in profitability for big business, but the sliding down into labour intensive practices, something enhanced by the import substitution environment cultivated at a time of effective de-globalization.

REFERENCES

Archival – Primary Sources

1. Efimeris tis Kivernisios. [Greek Government Gazette] Selected Issues: 1927-1937, Athens.

2. Charitakis, Georgios et al.(1940). Oikonomiki Epetiris tis Ellados 1939, [Economic Yearbook of Greece for 1939]. Athens: National Bank of Greece/Vlastos.

Bibliography

Anastasopoulos, Georgios (1946). History of Greek Industry, Vols. 2 and 3. Athens. (in Greek).

Angelopoulos, Angelos (1928). Sociétés Anonymes in Greece. Athens: Greek Society of Scientific Studies (in Greek).

Ashgarian, Hossein. (2003). 'Are highly leveraged firms more sensitive to an economic downturn?'. The European Journal of Finance (9) June: 219-241

Bank of Greece (1978). The first fifty years of the Bank of Greece. Athens: Bank of Greece (In Greek) .

Boyce, Gordon and Simon Ville (2002). The Development of Modern Business, Basingstoke: Palgrave.

Brealey R., S. Myers and F. Allen F (2008). Principles of Corporate Finance. McGraw Hill , 9th ed.

Cassis, Youssef (1997). Big Business, the European Experiences in the Twentieth Centuries, Oxford: Oxford University Press.

Clogg, Richard, (1994). A Concise History of Greece, Cambridge: Cambridge University Press.

Chandler, Alfred D, Franco Amatori and Takashi Hikino (1997), Big Business and the Wealth of Nations, Cambridge: Cambridge University Press.

Charitakis, George (1927). Greek Industry. Athens: Estia (in Greek).

Christodoulaki, Olga (2001). 'Industrial growth in Greece between the wars: A New Perspective'. European Review of Economic History. (5)1:.61-89.

Christodoulakis, Nicos 2013. "Currency crisis and collapse in interwar Greece: predicament or policy failure? European Review of Economic History. 17 (3): 272-293.

Dertilis, George, (2011). History of the Greeks State. Athens: Estia (in Greek).

Graham, John R, Sonali Hazarika Krishnamoorthy Narasimhan, (2011) Financial Distress in the Great Depression, Working Paper 17388 http://www.nber.org/papers/w17388.

Dritsas, Margarita (1990) Industry and Banks in Interwar Greece, Athens, MIET.(In Greek).

Louri, Helen and Ioanna Pepelasis Minoglou (2002), 'A Hesitant Evolution: Industrialization and De-industrialization in Greece over the Long Run', Journal of European Economic History, 31 (2): 321-348.

Franghiadis, Alexis (2007). The Greek Economy, 19th–20th Century. Athens: Alexandreia. (in Greek).

Fusari, Angelo and Angelo Reati. 2013. "Endogenizing technical change: Uncertainty, profits, entrepreneurship. A long-term view of sectoral dynamics", Structural Change and Economic Dynamics 24 : 76-100.

Hilton, MW and Darrell Herauf (1999). Modern advanced accounting – in Canada. McGraw-Hill Ryerson.

Hobsbawm, Eric (1997). The Age of Extremes: The Short Twentieth Century, 1914–1991, New York: Vintage Books.

Kostelenos, Georgios, DemitriosVasileiou, EmmanouelKounaris, Socrates Petmezas and Michail Sfakianakis (2007). Gross Domestic Product, 1830–1909. Athens: Centre of Economic Planning and Research (in Greek).

Kostis, Kostas (1986), Banks and the Crisis , Athens: Commercial Bank of Greece (In Greek).

Kostis, Kostas (1987). Agricultural Economy and Agrarian Bank: Aspects of the Greek Economy during the Interwar Period, 1919-1928. Athens: CulturalCentre of the National Bank of Greece (In Greek).

Kostis, Kostas (1992). "The Ideology of Economic Development: the Refugees in the Interwar Period". In Asia Minor Debacle and Greek Society. Athens: Bulletin of the Centre of Asia Minor Studies 9, pp.31-46 (In Greek).

Louri, Helen and Ioanna Pepelasis Minoglou (2002). 'A Hesitant Evolution: Industrialization and De-industrialization in Greece over the Long Run'. Journal of European Economic History, 31 (2): 321-348.

Mazower, Mark (1991). Greece and the Interwar Economic Crisis. Oxford: Clarendon Press.

Modigliani, F.; Miller, M. (1958)."The Cost of Capital, Corporation Finance and the Theory of Investment". American Economic Review 48 (3): 261–297. JSTOR 1809766.

Notta, Ourania and Aspasia Vlachvei (2014). 'The impact of Financial Crisis on firm performance in case of Greek food manufacturing firms'. Procedia Economics and Finance (14): 454 – 460.

Pepelasis Minoglou, Ioanna (1993), 'The Greek State and the International Financial Community, 1922-1932: Demystifying the Foreign Factor (Ph.D, LSE).

Pepelasis Minoglou, Ioanna, (1999). 'Greece: From Rent Seeking Protectionism to Direct Intervention'. In Foreman-Peck, J. and Federico, G. (eds), European Industrial Policy: The Twentieth Century Experience Oxford University Press, Oxford.

Pepelasis Minoglou, Ioanna (2002). 'Between Informal Networks and Formal Contracts: International Investment in Greece during the 1920s', Business History**,** 44 (2): 40-64.

Pepelasis, Ioanna Sapfo and Konstantinos Aivalis (2014),Joint Stock Company Births in Turbulent Times: Greece, 1909-1929, AUEB, Department of Economics, Working Paper Series, number 5-2014.

Porter, E. Michael (1990). The Competitive Advantage of Nations. New York: Free Press.

Psalidopoulos, Michalis, (2011). Financial Administration and Economic Crisis, The Policy of the Bank of Greece,1929-1941. Athens: Bank of Greece (In Greek).

Riginos, Michalis (1986). "Fluctuations of Industrial Wages in Greece, 1912-1936". Historika 3/5, pp.151-176 (In Greek).

Riginos, Michalis (2015). The Historical Concurrence and the Athens Stock Exchange, 1880-1940'. Seminar talk at Greek Economic History Association meeting April 27 (In Greek).

Ross, S.A., RW Westerfield, and J Jaffe (2013). Corporate Finance. 10th edition, McGraw-Hill.

Tsotsoros, Stathis (1993). The Formation of Industrial Capital in Greece, 1898-1939. Athens: MIET (In Greek).

APPENDIX

PART 1

TABLE 1

FINANCIAL INDICATORS IN DATA BASE

Currency, gross fixed assets, depreciation, net assets, current assets, circulating capital, total assets, share capital-equity, share capital-own, own capital, net wealth, short term liabilities, short-term banking liabilities, other short term liabilities, long term liabilities, banking long term liabilities, gross profits, other operating revenues, interest paid, other revenues, pre-tax profits.

TABLE 2

INDUSTRY INDEXES FOR THE COUNTRY AS A WHOLE AND TOP 50 PERFORMANCE INDICATORS

	Supreme Economic Council Base year: 1938	Mazower Index Base year: 1938	Christodoulakii New Index C Base year: 1938	Christodoulaki New Index D Base year: 1938	Top 50 data base Mean assets in 1914 prices	Top 50 data base FCA
1927	56.17	62.49	61.30	50.99	62.261.487	0,1278
1928	59.50	67.34	71.01	59.25	71.938.381	0,1299
1929	60.56	68.75	74.98	63.85	83.359.432	0,1071
1930	62.64	70.30	69.42	61.58	76.031.232	0,1444
1931	64.78	70.98	67.20	61.22	77.800.331	0,1414
1932	61.08	67.74	66.20	60.91	85.012.969	0,2030
1933	66.51	75.42	74.70	67.81	85.882.664	0,2040
1934	75.84	89.90	85.35	78.82	87.572.129	0,2423
1935	85.18	88.62	88.92	83.74	90.490.514	0,2830
1936	84.32	93.54	92.24	90.17	133.494.153	0,2355

Compiled from Christodoulaki 2001 and our data base

PART 2

TABLE 1: MEAN VALUE OF RATIO (CFA = CASH FLOW / TOTAL ASSETS) PER SIZE					
YEAR	Large(1)	Small(1)	Large(2)	Small(2)	Total sample
1927	0,1145	0,1327	0,1411	0,1222	0,1278
1928	0,0962	0,1415	0,1074	0,1394	0,1299
1929	0,0816	0,1151	0,0759	0,1192	0,1071
1930	0,1446	0,1443	0,1276	0,1503	0,1444
1931	0,1497	0,1392	0,1233	0,1470	0,1414
1932	0,1856	0,2093	0,1835	0,2109	0,2030
1933	0,2312	0,1941	0,2349	0,1914	0,2040
1934	0,2436	0,2418	0,2591	0,2349	0,2423
1935	0,2306	0,2990	0,2871	0,2814	0,2830
1936	0,2145	0,2460	0,2613	0,2196	0,2355

Large (1) = companies id: 3,1,6,4,5,13,8,7,14,10,15,22,23
Small (1) = all companies except the above

_____

Large(2)= companies id: 3,1,6,4,5,13,8,7,14,10,15,12,11,9,17
Small(2)= all companies except the above

TABLE 2: MEAN VALUE OF OPERATING LEVERAGE RATIO (NET FIXED ASSETS/TOTAL ASSETS) PER SIZE					
YEAR	Large(1)	Small(1)	Large(2)	Small(2)	Total sample
1927	0,3481	0,4610	0,3371	0,4693	0,4302
1928	0,3833	0,4350	0,3749	0,4415	0,4221
1929	0,3804	0,4362	0,3752	0,4412	0,4231
1930	0,3938	0,4231	0,3906	0,4250	0,4162
1931	0,3821	0,4368	0,3585	0,4456	0,4252
1932	0,3649	0,4162	0,3734	0,4145	0,4031
1933	0,3891	0,4226	0,3979	0,4205	0,4144
1934	0,3868	0,3902	0,3795	0,3933	0,3894
1935	0,3522	0,3770	0,3580	0,3763	0,3713
1936	0,3792	0,2910	0,3913	0,2778	0,3190

TABLE 3: MEAN VALUE OF FINANCIAL LEVERAGE RATIO (TOTAL LIABILITIES / TOTAL ASSETS) PER SiZE					
YEAR	Large(1)	Small(1)	Large(2)	Small(2)	Total sample
1927	0,5578	0,4683	0,5946	0,4499	0,4927
1928	0,5488	0,4894	0,6005	0,4646	0,5043
1929	0,5863	0,5587	0,6572	0,5304	0,5652
1930	0,5232	0,5621	0,6188	0,5304	0,5530
1931	0,5506	0,5469	0,6513	0,5160	0,5477
1932	0,5712	0,5242	0,6063	0,5094	0,5362
1933	0,5582	0,5281	0,5866	0,5160	0,5359
1934	0,5607	0,5098	0,5801	0,4985	0,5228
1935	0,5916	0,5518	0,6070	0,5438	0,5609
1936	0,6827	0,5676	0,6447	0,5811	0,6042

TABLE 4: MEAN VALUE OF LIQUIDITY RATIO (CURENT ASSETS / TOTAL CURRENT LIABILITIES) PER SIZE					
YEAR	Large(1)	Small(1)	Large(2)	Small(2)	Total sample
1927	1,3483	1,4040	1,2730	1,4409	1,3877
1928	1,2886	1,4807	1,1912	1,5371	1,4295
1929	1,2458	1,3856	1,0630	1,4623	1,3527
1930	1,6069	1,4880	1,2320	1,6131	1,5158
1931	1,6445	1,3659	1,2055	1,4959	1,4265
1932	1,5180	1,5680	1,4016	1,6169	1,5547
1933	1,6019	1,6689	1,5310	1,6998	1,6510
1934	1,6273	1,8474	1,6357	1,8574	1,7899
1935	1,4641	1,7850	1,7275	1,7006	1,7082
1936	1,2196	1,5847	1,4665	1,4608	1,4630

TABLE 5: MEAN VALUE OF SOLVENCY RATIO, TIE = ((NET PROFIT + INTEREST) / INTEREST) PER SIZE					
YEAR	Large(1)	Small(1)	Large(2)	Small(2)	Total sample
1927	4,9655	4,8709	6,3101	4,3705	4,8927
1928	3,3531	2,7523	3,5107	2,6562	2,9125
1929	3,0248	2,1434	2,2560	2,4178	2,3709
1930	3,2369	2,4455	2,7229	2,6116	2,6434
1931	2,0112	0,9709	1,7038	1,0419	1,2310
1932	2,0214	1,8970	1,7135	2,0624	1,9368
1933	2,4403	1,4289	2,1385	1,5404	1,7540
1934	3,5264	2,5906	2,5458	3,0573	2,8679
1935	3,1760	3,4193	2,5979	3,8110	3,3444
1936	1,7629	1,4345	1,6542	1,5067	1,5861

TABLE 6: MEAN VALUE OF EFFICIENCY RATIO, GPCA = (GROSS PROFIT / CURRENT ASSETS) PER SIZE					
YEAR	Large(1)	Small(1)	Large(2)	Small(2)	Total sample
1927	0,2786	0,4359	0,3286	0,4207	0,3937
1928	0,2611	0,3437	0,2924	0,3359	0,3231
1929	0,2866	0,3307	0,2768	0,3371	0,3204
1930	0,2582	0,2884	0,2515	0,2913	0,2818
1931	0,3079	0,2387	0,2404	0,2560	0,2525
1932	0,2841	0,3802	0,2952	0,3790	0,3556
1933	0,3189	0,3315	0,3312	0,3272	0,3283
1934	0,3139	0,3888	0,3545	0,3774	0,3709
1935	0,2937	0,3572	0,3417	0,3416	0,3417
1936	0,2954	0,3210	0,3386	0,2982	0,3129

PART 3

TABLE 1

	CFA	ATR	TDE	CUR	TIE	GPCA
CFA	1.000000	-0.145074	0.049887	0.166844	0.367852	0.430062
ATR	-0.145074	1.000000	-0.305939	-0.351817	-0.135612	0.424912
TDE	0.049887	-0.305939	1.000000	-0.360093	-0.315317	-0.212790
CUR	0.166844	-0.351817	-0.360093	1.000000	0.110622	-0.021500
TIE	0.367852	-0.135612	-0.315317	0.110622	1.000000	0.268881
GPCA	0.430062	0.424912	-0.212790	-0.021500	0.268881	1.000000

PART 4

Unit root tests

Panel unit root test: Summary
Series: **XCFA**

Sample: 1 511
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.95717	0.0000	50	355
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	0.36896	0.6439	49	352
ADF - Fisher Chi-square	103.661	0.3810	50	355
PP - Fisher Chi-square	139.087	0.0060	50	363

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: XATR

Sample: 1 511
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.13591	0.0000	50	367
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.54030	0.2945	50	367
ADF - Fisher Chi-square	124.470	0.0492	50	367
PP - Fisher Chi-square	156.717	0.0003	50	374

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: XTDE

Sample: 1 511
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.98455	0.0000	50	367
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.42462	0.3356	50	367
ADF - Fisher Chi-square	129.545	0.0251	50	367
PP - Fisher Chi-square	163.614	0.0001	50	376

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: XCUR

Sample: 1 511
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.34469	0.0000	50	352
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.98919	0.0233	49	349
ADF - Fisher Chi-square	142.713	0.0033	50	352
PP - Fisher Chi-square	136.976	0.0083	50	359

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: XTIE

Sample: 1 511
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-27.9881	0.0000	33	196
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.75685	0.0000	27	178
ADF - Fisher Chi-square	117.175	0.0001	33	196
PP - Fisher Chi-square	136.467	0.0000	33	203

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: XGPCA

Sample: 1 511
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-45.7111	0.0000	49	337
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.57156	0.0000	48	334
ADF - Fisher Chi-square	205.984	0.0000	49	337
PP - Fisher Chi-square	252.312	0.0000	49	350

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.