Non-serviced loans of Greek banks

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Abstract

Introduction

The increase in non-performing loans has a significant impact on banks' balance sheets with possible negative consequences for them. There are two primary criteria that reflect the two dimensions of a credit event: a) the time dimension (days of delay), b) the qualitative dimension, the possibility of non-repayment. Therefore, the term "non-serviced loan" implies a failure to repay. Therefore, the term "non-serviced loan" implies a failure to repay. In general, there are two types of interventions for the restructuring of problematic portfolios, "in-balance intervention" where the problematic elements are isolated and the government offers guarantees but remain in the balance sheet of the bank and "off-balance intervention" where the problematic data are transferred off-balance sheet, usually in a specialized management company.

When Europe was called upon to cope with the effects of the mortgage crisis in 2008, it had to split many banks into "good" and "bad", and to set up asset management companies (AMCs) to recover the value of bad assets and mainly non-performing loans. Between 2008 and 2014, 12 AMCs were created in 12 EU Member States to reorganize the portfolio of 37 banks (Gandrudand Hallerberg, 2014). Contrary to other countries, in Greece, the financial crisis affected the economy as a whole and ultimately the whole financial system. The deficit in 2009 has put an end not only in Greece, which has gone one step before bankruptcy, but also the entire Eurozone. The credit rating of the country has been downgraded and, consequently, the banks as well. The Bank of Greece, with the Code of Conduct for Non-Loan Loans, has established general principles of conduct and has adopted best practices that should govern the relationships of banks with borrowers who find it difficult to repay their loans.A positive contribution to tackling the problem of non-performing loans is expected to have banks' obligation to achieve specific NPLs.

NPL’s 2005-2016 at four Greek banks

It can be seen from the diagram below, the change in non-performing loan prices in the four banks we are considering. Obviously, prices have a similar pattern over the entire duration of this sample and the upward trend in all four banks in the NPLs indicator is clear.

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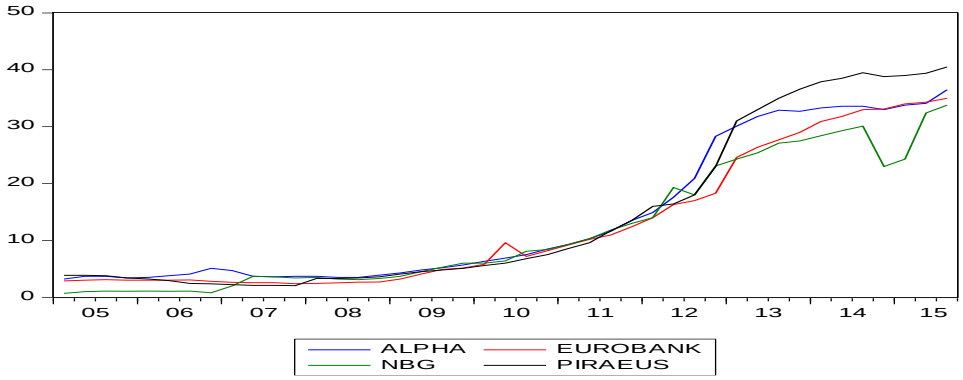


The same conclusions are derived from the values of descriptive statistics. All variables have close averages and similar asymmetry as well as bending values. As a result, we can view the parallel course of bank indices.

	PIRAEUS	NBG	EUROBANK	ALPHA
Mean	14.38186	11.78047	12.59907	13.99605
Median	6.000000	6.400000	7.200000	6.900000
Maximum	40.50000	33.80000	35.00000	36.50000
Minimum	2.050000	0.700000	2.400000	3.200000
Std. Dev.	14.38310	10.88131	11.75978	12.50680
Skewness	0.869677	0.674859	0.829450	0.756315
Kurtosis	2.037571	1.912810	2.086349	1.804826
Jarque-Bera	7.079994	5.381667	6.426188	6.658709
Probability	0.029013	0.067824	0.040232	0.035816
Sum	618.4200	506.5600	541.7600	601.8300
Sum Sq. Dev.	8688.695	4972.920	5808.283	6569.638
Observations	43	43	43	43

To figure out the large correlation, we will proceed with the calculation of the Pearson correlation coefficients.

	ALPHA	EUROBANK	NBG	PIRAEUS
ALPHA	1.000	0.9876	0.9839	0.9919
EUROBANK	0.9877	1.0000	0.9767	0.9952
NBG	0.9839	0.9767	1.0000	0.9747

PIRAEUS	0.9919	0.9952	0.9747	1.0000

The results of the correlation table between the variables also prove algebraically the findings from the earlier created diagram. The smallest factor is 0.9747 which is of an extremely high value. These values indicate the existence of autocorrelation and cointegration of the variables, which means that in order to better explain the relationships we should proceed to the calculation of VAR self-spanning vectors. First of all, the number of delays that are optimal for our model must be decided. Because of the availability of quarterly data, we have to put the four as a number of delays. however, there are special tests that will run at Eviews with a view to the best number decision. The relevant table is the following:

VAR Lag Order Selection Criteria

Endogenous variables: ALPHA EUROBANK NBG PIRAEUS

Exogenous variables: C

Included observations: 37

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-354.3418	NA	3036.222	19.36982	19.54398	19.43122
1	-206.2333	256.1875	2.420503	12.22883	13.09960*	12.53582
2	-182.0247	36.64005*	1.605467	11.78512	13.35250	12.33770
3	-162.8345	24.89544	1.471429	11.61268	13.87667	12.41084
4	-143.2564	21.16549	1.440643*	11.41927	14.37987	12.46302
5	-127.0387	14.02615	1.948122	11.40750	15.06472	12.69684
6	-98.05144	18.80255	1.677795	10.70548*	15.05932	12.24041*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5%)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

The next check we need to make is whether or not there is a cointegration. If there is integration between the variables, we should choose a different model of analysis. We

chose the Johansen co-integration check and the results are shown in the following table.

Date: 05/14/17 Time: 11:55

Sample (adjusted): 2006Q2 2015Q3

Included observations: 38 after adjustments

Trend assumption: Linear deterministic trend

Series: ALPHA EUROBANK NBG PIRAEUS

Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.593043	62.17555	47.85613	0.0013
At most 1	0.394346	28.01172	29.79707	0.0792
At most 2	0.209399	8.956731	15.49471	0.3694
At most 3	0.000742	0.028200	3.841466	0.8666

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.593043	34.16383	27.58434	0.0062
At most 1	0.394346	19.05499	21.13162	0.0952
At most 2	0.209399	8.928531	14.26460	0.2922
At most 3	0.000742	0.028200	3.841466	0.8666

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The results of the above check show that there is a coincidence between the variables. For this reason, we have to choose the Vector Error Correction Model (VECM). First by going to the Granger causality test to find out whether or not there is a correlation of variables.

VEC Granger Causality/Block Exogeneity Wald Tests

Dependent variable: D(ALPHA)

Excluded	Chi-sq	df	Prob.
D(EUROBANK)	5.180696	4	0.2693
D(NBG)	19.67309	4	0.0006
D(PIRAEUS)	8.032139	4	0.0904
All	40.05400	12	0.0001

Dependent variable: D(EUROBANK)

Excluded	Chi-sq	df	Prob.
D(ALPHA)	14.42049	4	0.0061
D(NBG)	3.746429	4	0.4414
D(PIRAEUS)	3.641431	4	0.4567
All	47.76210	12	0.0000

Dependent variable: D(NBG)

Excluded	Chi-sq	df	Prob.
D(ALPHA)	1.454902	4	0.8346
D(EUROBANK)	1.989068	4	0.7378
D(PIRAEUS)	2.076113	4	0.7218

All	9.872316	12	0.6272

Dependent variable: D(PIRAEUS)

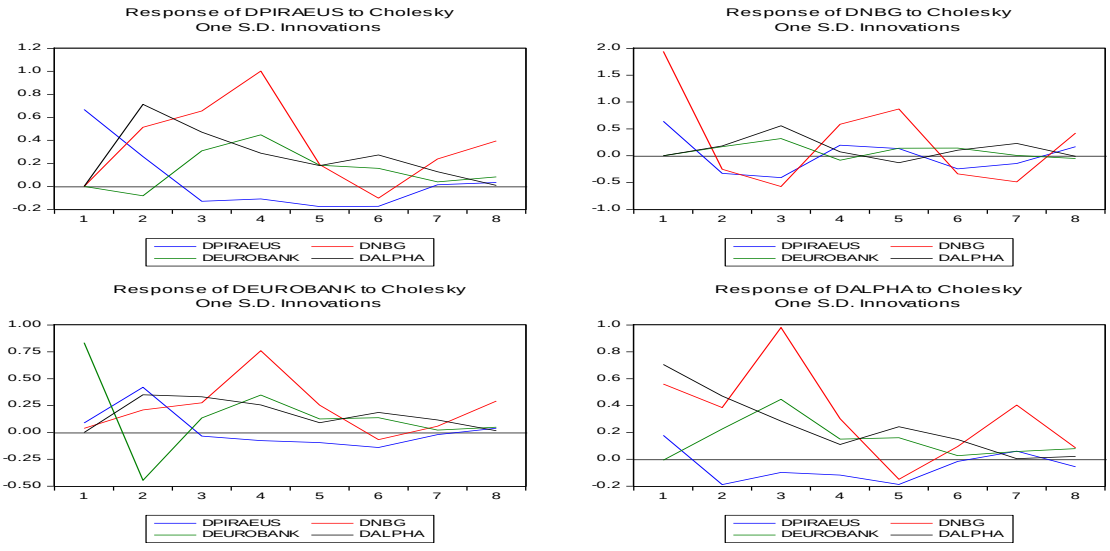
Excluded	Chi-sq	df	Prob.
D(ALPHA)	21.57320	4	0.0002
D(EUROBANK)	1.741302	4	0.7832
D(NBG)	4.151853	4	0.3858
All	29.77125	12	0.0030

According to Granger's Cause of Causality, we have a relationship between the National Bank to Alpha and Alpha to Eurobank and Piraeus.

Impulse response

In addition to estimating the effect of past values on current ones, it is interesting to estimate the impact that a shock may have on our values of variables within the next timeframe. For this reason we create Eviews for the assessment of disturbances for the next 4 periods, since the reference period is the quarter and therefore an eight-quarter period corresponds to an estimate for the next two years.

The results are shown in the following tables:



The disorder we examined is of the order of a standard deviation, according to the

Cholesky method. In each chart we see the effects of each bank's disruption on itself and on the other banks. Eurobank declines in the second quarter before returning to positive rates where it is retained, with the exception of the sixth quarter and therefore showing negative results. This means that the growth rates of non-performing loans will remain positive for the next two years, with the exception of the second and sixth quarters. Correspondingly, we see that the effects of the disruption in Eurobank on the other banks give different results. Bottom line is that all banks at the beginning show an increase of NPLs, but Piraeus bank, shows a decrease after Q3.

At the National Bank we have an interesting result. The initial increase from the disorder of a standard deviation that we apply is almost immediately abolished, and in the second quarter the bank's index is falling sharply. It then shows a cyclical course with a change in direction of the index every two quarters. The same course has Piraeus, but with smaller fluctuations than the National. The other two banks show greater stability, and after their initial rise, their indices are close to zero.

When the disruption is implemented in Piraeus, the bank itself declines in the first three quarters and remains in negative values up to the seventh quarter. The remaining banks show an increase in their indices, which begins to decline after the fourth quarter and remain positive with the exception of National Bank in the sixth quarter. Interesting is the price of banks in the eighth quarter, with the exception of National Bank, which is on the upside.

Finally, for Alpha we see that only Piraeus is positively affected and shows a decline in the non-performing loans ratio. The rest of the banks have in general positive rates with ups and downs at their rates, but at the Q8 seem to converge.

Conclusion

One of the most important problems faced by the Greek economy in recent years is the management of non-performing loans. Effective management is undoubtedly the most important challenge that the banking system faces. The high rate of non-performing loans reduces banks' available funds for new financing on the one hand and increases the interest rate that banks have to charge to offset the increased credit risk they incur.