BLACKROCK SOLUTIONS®

Project Aura

Asset Quality Review and Credit Loss Projection Methodology

Prepared for the Bank of Greece

5 March 2014

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Abbreviations and Key Terms

Abbreviations

AQR	Asset Quality Review
BN	Billion
BoG	Bank of Greece
BoP	Beginning of Period
CHF	Swiss Franc
CLP	Credit Loss Projections
CRE	Commercial Real Estate
CSP	Credit Support Program
CW	Cushman & Wakefield
DPD	Days Past Due
DSCR	Debt Service Coverage Ratio
DTI	Debt to Income
EAD	Exposure at Default
EBA	European Banking Authority
EC	European Commission
ECB	European Central Bank
EoP	End of Period
EU	European Union
EUR	Euro
EY	Ernst & Young
FLB	Foreign Loan Book
GDP	Gross Domestic Product
GGB	Greek Government Bond
HFSF	Hellenic Financial Stability Fund
HPI	Home Price Index
ICR	Interest Coverage Ratio
IMF	International Monetary Fund
IT	Information Technology
K	Thousand
KPI	Key Performance Indicators
KYC	Know Your Customer
LFR	Loan File Review
LGD	Loss Given Default
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LTV	Loan to Value
MIS	Management Information System
MM	Million
MoU	Memorandum of Understanding
MRA	Moody's Risk Advisor
NAI	NAI Hellas
NDI	Non-declared income
NCF	Net Cash Flow
NOI	Net Operating Income
NPL	Non Performing Loan
NPV	Net Present Value
PD	Probability of Default
PTI	Payment to Income
RFI	Request for Information
RM	Relationship Manager
SBP	Small Business and Professional
SPV	Special Purpose Vehicle
SME	Small and Medium Enterprises
TAR	Troubled Asset Review
TMM	Transition Matrix Model
VAT	Value Added Tax
WA	Weighted Average

Definition of Key Terms

Denounced – performance status of a loan that typically has been more than 360 DPD and where the bank deemed the borrower unlikely to make any additional payments. The account is typically closed and moved to legal status where enforcement action is initiated

Forbearance – a form of loan modification where it is unclear or unlikely that the borrower will be in a position to ultimately repay the outstanding debt and where the bank may also be deferring enforcement action regardless

Modification – represents any type of loss mitigation practice, in which the bank agrees to either a temporary or permanent amendment to the contractual terms of the loan (e.g., interest rate, amortisation term) including forbearance, restructurings and reschedulings

Restructuring – change of original contract terms on non-commercial terms normally applied for exposures that are 90+ DPD

Rescheduling – change of original contract terms on commercial terms normally applied before exposures become 90+ DPD

Tangible Collateral – represents collateral securing a loan other than personal, corporate or 3rd party guarantees. This includes cash, securities, receivables, real estate, land, vehicles or other assets that can be liquidated following an event of default

Troubled Assets – for the purpose of the Diagnostic Assessment, troubled assets are defined as (i) loan exposures above 90 days in arrears or loans with a default rating depending on the asset class and (ii) modified loans up to 90 days in arrears, including Current Modified loans

Executive Summary

This report dated 5 March 2014 is an abridged version of the full report submitted to the Bank of Greece on 30 November 2013. It redacts the CLP results as well as the individual chapters on each Bank.

1.1. Overview

In July 2013, the Bank of Greece ("Bank of Greece" or "BoG") engaged BlackRock Solutions ("BlackRock") to conduct a diagnostic assessment of the loan portfolios of a select group of Greek commercial banks ("Diagnostic Assessment") as of 30 June 2013 ("Reference Date"). In a Memorandum of Understanding ("MoU") between the European Commission ("EC"), the European Central Bank ("ECB") and the International Monetary Fund ("IMF"), collectively known as the "Troika," and Greece, the authorities agreed for the Diagnostic Assessment to be completed by the end of 2013. This follows a similar exercise conducted in 2011 (the "2011 Diagnostic").

The banks under examination comprised the four largest banks defined as Group A Banks and seven smaller banks defined as Group B Banks (each, a "Bank" or, together, the "Banks").

Figure 1: Greek Banks under Review in the Diagnostic Assessment

Group A Banks	Group B Banks
Alpha Bank ("Alpha")	Aegean Baltic Bank SA ("ABB")
Eurobank Ergasias ("Eurobank")	Attica Bank ("Attica")
NBG ("NBG")	Credicom Consumer Finance ("Credicom")
Piraeus Bank ("Piraeus")	New Proton Bank SA ("Proton")[1]
	New TT Hellenic Postbank ("TT")[1]
	Panellinia Bank SA ("Panellinia")
	Probank SA ("Probank")[2]

The Greek banking sector has undergone significant consolidation activity over the past 18 months. An overview of recent acquisition and merger activity in the Greek banking sector, as well as a comparison to the scope of entities subject to review in the 2011 Diagnostic is shown in Section 1.3 below. Banks or banking assets legally acquired after the Reference Date, such as Proton, TT and Probank, were analysed on a stand-alone basis and designated a Group B Bank.

The Diagnostic Assessment consisted of four workstreams as outlined below. This report comprises an overview of the AQR and CLP workstreams. The results of the TAR and FLB workstreams form part of separate project deliverables submitted to the Bank of Greece.

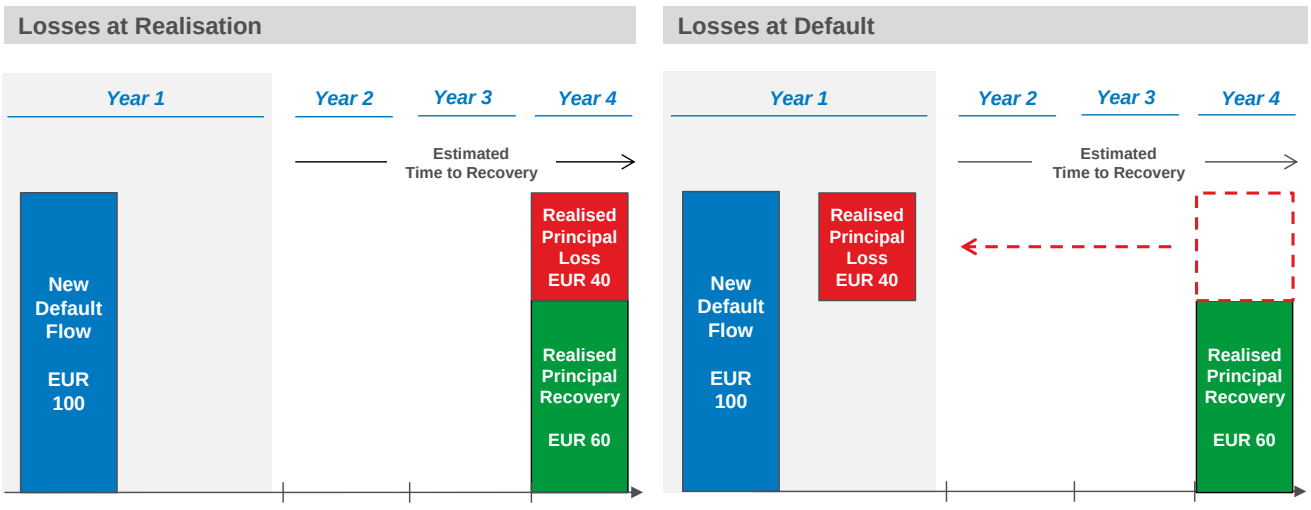
[1] Acquired by Eurobank in August 2013
[2] The "good bank" of Probank was acquired by NBG in July 2013

A. **Asset Quality Review ("AQR")** – Assessment of the credit quality of loans as well as the current portfolio management practises of each Bank. The assessment was based on a comprehensive project framework including (i) line-level portfolio data analytics and qualitative data due diligence, (ii) qualitative findings from management due diligence, (iii) risk-based loan file reviews ("LFR") on a sample of loans across all asset classes, and (iv) sample-based valuations of properties collateralising loan exposures.

B. **Credit Loss Projections ("CLP")** – Estimate of forward-looking 3-year and lifetime credit loss projections for each of the Group A and B Banks by asset class and under Base and Adverse Cases and other key assumptions as specified by the Bank of Greece and approved by the Troika[3]. The CLPs were derived from bespoke financial models tailored to the specificities of the Greek market and are based on line-level loan, collateral, borrower and ratings data submissions provided by the Banks, including up to 5 years of historical performance data. They were further informed by the results of the various AQR processes such as large loan re-underwriting, portfolio data analytics, LFRs and collateral valuations.

BlackRock's projected credit losses represent undiscounted principal losses. The original version of this report dated 30 November 2013 calculated the results on a when-realised basis and subsequently allocated the losses to the year of default ("Losses at Default"). Per the request of the Bank of Greece, a revised report dated 11 February 2014 also shows losses calculated on a when-realised basis without subsequent allocation to the year of default ("Losses at Realisation"). As can be seen in the Figure below, the lifetime losses for both methods are the same; it is only the distribution of the losses over time that varies.

Figure 2: Illustrative Comparison of Losses at Realisation and Losses at Default



Per the request of the Bank of Greece, BlackRock performed a sensitivity analysis for projected lifetime losses under the Base and Adverse Case for the Residential Mortgage asset class. The sensitivity analysis varied certain model inputs such as cure rates, forced sale discounts and liquidation expenses and also incorporated a scenario where the foreclosure moratorium was assumed to be extended until 31 December 2014 to reflect the pending legislation about to be approved by the Greek parliament. BlackRock notes that, as there is no historical data available for an improving Greek housing market and macroeconomic conditions, or in the absence of a foreclosure moratorium, some judgement in deriving final assumptions is required. The sensitivity analysis provided the Bank of Greece with a robust set of assumptions for their assessment.

[3] Please see Section 1.4 for further detail

C. **Troubled Asset Review ("TAR")** – Assessment of the operational preparedness and effectiveness of the Group A Banks' established frameworks, policies, procedures and practices to deal with the large-scale resolution of troubled assets[4]. The review focused on the Residential Mortgage, SME, SBP and Consumer asset classes across the four Group A Banks and was based on a comprehensive project framework including portfolio data review, qualitative management due diligence, documentation review, sample-based LFRs and site visits[5]. BlackRock submitted its report *Project Aura – Troubled Asset Review* to the Bank of Greece on 30 September 2013, and subsequently delivered an addendum for the Consumer asset class on 16 October 2013. The reports covered the following sections for each asset class per Bank: (i) Organisation, Resource Capacity and Staffing, (ii) Credit Policies and Guidelines, (iii) Resolution Strategies and Execution Ability, and (iv) Reporting and Quality Assurance.

D. **Foreign Loan Books Review ("FLB")** – Review of the Greek domestic banking operations of the seven largest foreign subsidiaries of the Group A Banks ("Foreign Subsidiaries"). The objective of this workstream was to (i) gain insight into domestic origination, loan monitoring and loss mitigation practices; (ii) assess the aggregate characteristics and quality of the foreign loan portfolios; and (iii) conduct a reasonableness assessment of 1-year probability of default ("PD") and loss given default ("LGD") estimates as provided by the Foreign Subsidiaries. The review was based on a comprehensive project framework including a high-level portfolio data review, qualitative management due diligence, high-level documentation review and solicitation of market data and trends such as forward-looking real estate value curves from local third-party vendors. BlackRock submitted its findings in a separate report to the Bank of Greece on 6 December 2013.

In order to meet the demanding project timelines and perform the significant scope across workstreams, BlackRock assembled a large project team comprising project managers, product and analytics specialists, and bank relationship managers. In addition, the BlackRock team was supported by external vendors and consultants engaged to perform specific scopes of services for the AQR workstream. For the Residential Mortgages and Consumer review, BlackRock engaged Clayton Euro Risk Management ("Clayton") to assist with LFRs and qualitative assessment of existing bank practises. For SME and SBP, BlackRock engaged Ernst & Young ("EY") to perform LFRs. BlackRock also engaged Clayton, along with Colliers International ("Colliers"), to perform drive-by valuations on a sample of residential properties and Cushman Wakefield ("CW") and NAI Hellas ("NAI") to perform desktop valuations on a sample of commercial real estate properties. Finally, BlackRock also retained three law firms - Karatzas & Partners Law Firm, PotamitisVekris, and Papapolitis & Papapolitis – to provide advice on an as needed basis as it related to legal aspects of specific due diligence questions. The verification and validation of data, documentation, analyses and other work product provided by these external vendors was beyond the scope of the Diagnostic Assessment, and BlackRock did not undertake the independent confirmation of such information.

[4] For the purposes of the TAR, troubled assets were defined as (i) loans above 90 days in arrears or loans with a default rating depending on the asset class, and (ii) Modified loans up to 90 days in arrears, including current Modified loans

[5] In total, 72 due diligence meetings and site visits were conducted, 520 LFRs were performed and 550 Bank internal documents were reviewed

For the purposes of the Diagnostic Assessment, BlackRock categorised loan exposures into the following asset classes in accordance with the Banks' existing classifications:

Figure 3: Asset Class Descriptions

	Asset Class	Description
Retail Loans	Residential Mortgages	Loans that are secured by a residential property
	Consumer	Non-mortgage related consumer loans further divided into: • Revolving Loans • Auto Loans • Other Consumer Loans
	Small Business and Professional ("SBP")	Small business loans to borrowers generally having an annual turnover of less than EUR 2.5 MM
Commercial Loans	Corporate	Commercial loans to Corporate borrowers generally with an annual turnover above a certain limit as defined by the Banks[6] The limits were EUR 25 MM, EUR 50 MM, EUR 70 MM and EUR 75 MM for Eurobank, NBG, Piraeus, and Alpha, respectively
	Asset Class	**Description**
Commercial Loans	Small and Medium Enterprises ("SME")	Commercial loans to borrowers generally having an annual turnover of between EUR 2.5 MM and the limits listed under Corporate above[7]
	Commercial Real Estate ("CRE")	Commercial loans originated for the purpose of financing commercial real estate and primarily collateralised by CRE property, including CRE loans issued by Greek leasing subsidiaries
	Shipping	Commercial loans collateralised by shipping vessels or loans issued to ship owners

As an additional segmentation overlay to Commercial Loans, the following designations were applied for the purposes of the Diagnostic Assessment. These categories are subsets of Commercial Loans; as such, they are not mutually exclusive from the asset class descriptions outlined above, or with each other.

[6] Excludes Shipping and Commercial Real Estate loans, which are separately defined

[7] Many of the Group B Banks often listed all loans to businesses as Corporate, but for the purposes of this report, BlackRock re-categorised Group B Corporate loans with funded balances less than EUR 2.5 MM as SME

Figure 4: Commercial Loans Segmentation Overlays

	Segmentation Overlays	Description
Commercial Loans	Large Loans	Borrowers with funded balances and committed unfunded exposures in excess of EUR 25 MM
	State-Related Loans	Commercial loans with Greek State-Related exposures as defined by the following categories: *1a) Explicitly Guaranteed Large Loans* – Loans to large state-owned companies or entities which are explicitly guaranteed by the State, as evidenced by a Joint Ministerial Decision (KYA) *1b) Explicitly Guaranteed Credit Support Programmes* – Loans to private sector companies which are explicitly guaranteed by TEMPME[8] or directly by the State through a KYA decision *2) State Ownership/Affiliation* - Loans to entities controlled and/or (partially) owned by the State, materially dependent on the State, or with some public purpose *3) State-Related Collateral* – Loans secured by Greek Government Bonds ("GGB"), subsidies, or other receivables from the State or State-Related entities ***"Public Loans" refer to loans in Categories 1a and 2 above***

1.2. Scope of Diagnostic Assessment

As agreed with the Bank of Greece, the Diagnostic Assessment covered loan exposures across all Group A and Group B Banks that were held in the (i) Solo accounts, which include loans in Greek domestic branches as well as foreign branches[9]; (ii) Greek domestic subsidiaries including leasing, factoring and financial companies; and (iii) foreign subsidiaries as of the Reference Date. By rule, all shipping loans remained within the scope, and all intercompany loans were excluded.

For the loans held in foreign branches and foreign subsidiaries, the scope only covered loans with "Greek Risk". Greek Risk was defined as loans (i) issued to a Greek borrower; or (ii) primarily secured by collateral located inside of Greece.

In order to isolate loans with Greek Risk in the foreign branches and foreign subsidiaries, BlackRock requested the Banks to identify and submit loan-level information for all relevant loans based on the definition above. BlackRock then performed a high-level assessment to check that the Bank properly interpreted the definition by cross-referencing submitted borrower and collateral portfolio data information. Foreign branches or foreign subsidiaries that did not hold any Greek Risk exposures and, therefore, did not submit any loan-level data, were required to submit a representation letter that was duly signed by an authorised person stating that the entity did not hold any loans with Greek Risk. A summary of this process is included in Appendix – Summary of Foreign Entity Submissions.

The final scope of the Diagnostic Assessment covered a universe of EUR 216 BN of loan exposures as of the Reference Date, comprised of loans totalling EUR 200 BN in funded exposure for Group A Banks and EUR 16 BN in funded exposure for Group B Banks. The following table provides an overview of the full scope which was reconciled against the regulatory reporting provided to the Bank of Greece as of the Reference Date.

[8] Credit Guaranteed Fund primarily for SME and SBP Enterprises

[9] Solo Accounts include all loans held in domestic and foreign branches as defined in Chapters 14 and 15 of the Codified Law 2190/1920 for Greek Societe Anonyme (SA), or in the case the entity is a listed company, in Chapters B and C of Law 3556/2007.

Figure 5: Scope of Diagnostic Assessment as of the Reference Date

Funded Balance (EUR MM)	Group A					Group B								
	Alpha	Euro.	NBG	Piraeus	Sub Total	ABB	Attica[1]	Credic.	Panel.	Probank	Proton	TT	Sub Total	TOTAL
A. Solo Accounts	51,849	34,109	43,953	66,463	196,374	207	3,549	370	607	2,871	1,332	7,138	16,073	212,447
B. Domestic Branches	50,183	33,907	42,066	63,782	189,939	207	3,549	370	607	2,871	1,332	7,138	*16,073*	206,012
C. Foreign Branches	1,666	202	1,887	2,680	6,435	-	-	-	-	-	-	-	-	6,435
D. Greek Risk	376	166	315	311	1,168	-	-	-	-	-	-	-	-	1,168
E. Non-Greek Risk (excl. from Scope)	*1,289*	*36*	*1,572*	*2,369*	*5,267*	-	-	-	-	-	-	-	-	*5,267*
F. Greek Domestic Subsidiaries	1,255	1,752	989	3,002	6,998	-	-	-	-	-	-	-	-	6,998
G. Leasing	749	1,369	585	2,555	5,258	-	-	-	-	-	-	-	-	-
H. Factoring	506	383	404	447	1,740	-	-	-	-	-	-	-	-	-
I. Financing Subsidiaries	-	-	-	-	-	-	-	-	-	-	-	-	-	-
J. Foreign Subsidiaries	9,442	9,955	24,676	5,369	49,443	-	-	-	-	-	-	-	-	49,443
K. Greek Risk	286	844	169	39	1,338	-	-	-	-	-	-	-	-	1,338
L. Non-Greek Risk (excl. from Scope)	*9,156*	*9,111*	*24,507*	*5,331*	*48,105*	-	-	-	-	-	-	-	-	*48,105*
M. Loans Requested from Banks (A + F + J)	**62,546**	**45,816**	**69,619**	**74,834**	**252,815**	**207**	**3,549**	**370**	**607**	**2,871**	**1,332**	**7,138**	**16,073**	**268,888**
N. Loans in Scope[2] (M - E - L)	**52,100**	**36,670**	**43,539**	**67,134**	**199,443**	**207**	**3,549**	**370**	**607**	**2,871**	**1,332**	**7,138**	**16,073**	**215,516**
O. Loans Analysed	**52,067**	**36,606**	**43,536**	**67,510**	**199,719**	**208**	**3,549**	**372**	**611**	**2,908**	**1,333**	**7,458**	**16,438**	**216,158**
P. Unexplained Gap	**-33**	**-64**	**-3**	**376**	**276**	**1**	**0**	**1**	**4**	**37**	**2**	**320**	**365**	**642**
as % of Loans in Scope	*0%*	*0%*	*0%*	*1%*	*0%*	*0%*	*0%*	*0%*	*1%*	*1%*	*0%*	*4%*	*2%*	*0%*

1. Attica Solo account balance shown is net of interest arrears and arrears charges on Corporate loans
2. BlackRock's Diagnostic Assessment excludes non-datatape exposures, including IFRS adjustments, Intercompany loans, receivables, reverse repos, and other out-of-scope items

1.3. The 2011 Diagnostic and Recent Greek Bank Consolidation Activity

In August 2011, the Bank of Greece first engaged BlackRock to conduct a diagnostic assessment of loan portfolios of a select group of Greek commercial banks as of a 30 June 2011 reference date, in support of certain requirements stipulated in an MoU between Greece and the Troika. The scope of the 2011 Diagnostic encompassed the AQR and CLP workstreams but did not include the TAR or FLB workstreams. The 2011 Diagnostic was completed over the course of four months and covered 18 institutions, which were grouped into 7 Group A Banks and 11 Group B Banks.

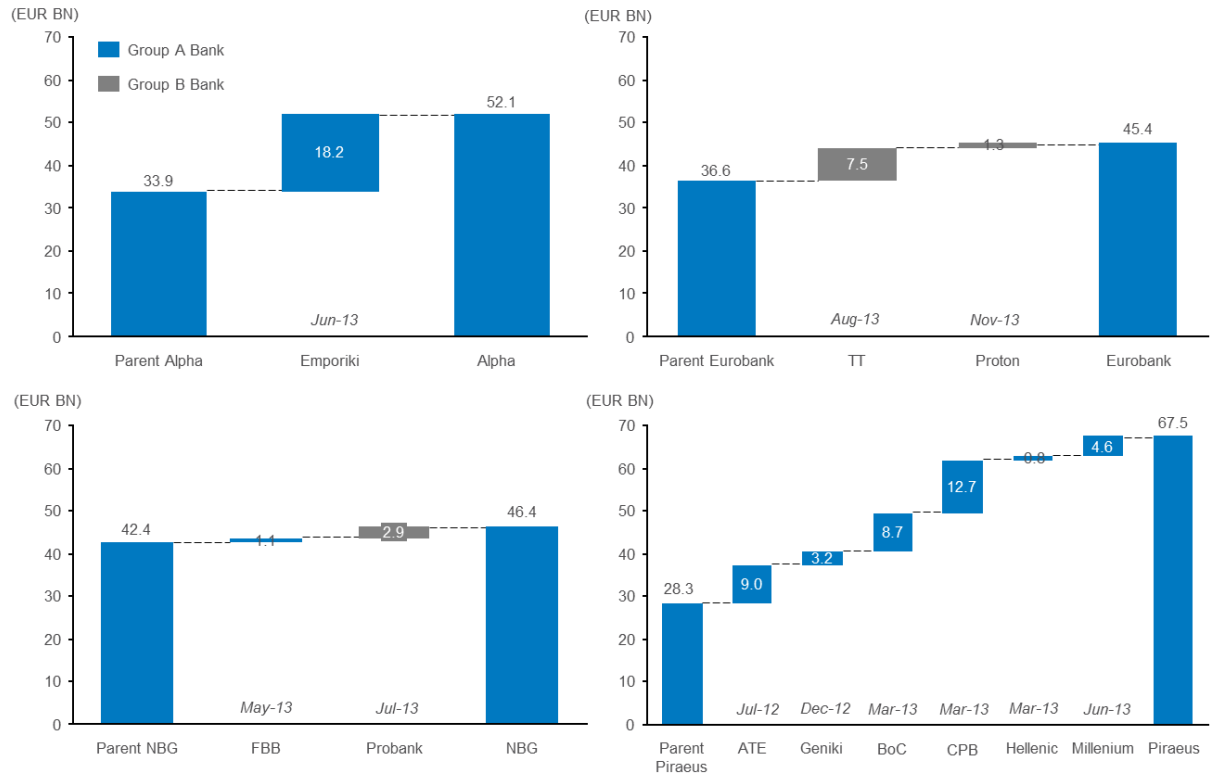
Figure 6: Greek Banks under Review in the 2011 Diagnostic

Group A Banks	Group B Banks
Agricultural Bank of Greece ("ATE")	ABB
Alpha	Attica
Eurobank	Credicom
Emporiki Bank of Greece ("Emporiki")	First Business Bank ("FBB")
NBG	General Bank of Greece SA ("Geniki")
Piraeus	Investment Bank of Greece ("IBG")
TT Hellenic Postbank ("TT")	Millennium Bank SA ("Millennium")
	Panellinia
	Probank
	Proton Bank SA
	T-Bank SA ("T Bank")

Since the completion of the 2011 Diagnostic, the Greek banking sector has undergone significant restructuring and consolidation. As a result, the number of entities forming part of the Group A Bank category reduced from 7 to 4, and the number of entities forming part of the Group B Bank category reduced from 11 to 7. The Greek

banking sector was also subject to a large-scale recapitalisation exercise, with 3 of the 4 Group A Banks – Alpha, NBG and Piraeus - retaining private sector status by successfully raising more than 10% of their capital requirements from private sources. Eurobank was fully recapitalised by the HFSF.

Figure 7: Recent Greek Banking Consolidation Activity[10]



As of the Reference Date, acquired banking assets made up 58% of funded exposure for Piraeus which had completed a total of 6 acquisitions since 2011, including the "good" assets of ATE[11] and the Greek operations of three Cypriot banks. Alpha acquired Emporiki in June 2013, which accounted for 35% of Alpha's funded exposure as of the Reference Date. Eurobank acquired TT and Proton in the second half of 2013 (after the Reference Date), and therefore, these entities remained in the Group B Bank category for the purposes of the Diagnostic Assessment. NBG acquired certain assets of FBB in May 2013 and announced the acquisition of certain assets of Probank in July 2013. Probank is also part of the Group B Bank category for the purposes of the Diagnostic Assessment.

Since the 2011 Diagnostic, asset quality across the Greek banking sector continued to deteriorate amid an adverse economic environment, political uncertainty, and the structural and fiscal reforms that form part of the bail-out conditions agreed with international lenders. Since the peak in 2007, Greek GDP contracted by approximately 25%, with unemployment levels at approximately 27% and youth unemployment exceeding 57%[12] at the time of the Reference Date.

The following Figure provides a side-by-side comparison of key credit metrics of the Group A Bank loan portfolios subject to the Diagnostic Assessment versus the 2011 Diagnostic. It is important to note that the credit metrics as presented are only directional in nature and are not directly comparable given recent bank

[10] Funded balances as of Reference Date
[11] For the purposes of the 2013 Diagnostic Assessment, ATE refers only to ATE Good Bank, which was acquired by Piraeus in June 2012
[12] IMF Country Report No. 13/241 (July 2013)

consolidation, on-going troubled asset resolution activity and deleveraging in the Greek banking sector.[13]

Figure 8: Group A Banks Key Credit Metrics: Diagnostic Assessment vs. 2011 Diagnostic

		2011 Diagnostic as of 30 Jun 2011				Diagnostic Assessment as of 30 Jun 2013			
		Residential	Consumer[1]	SBP	Commercial[2]	Residential	Consumer[1]	SBP	Commercial[2]
Portfolio Limits	Funded (€MM)	64,975	26,214	23,394	85,128	63,899	23,828	20,517	91,475
	Unfunded (€MM)	4,133	9,961	3,855	25,283	1,268	3,970	399	15,473
	Total Limit (€MM)	69,108	36,175	27,249	110,411	65,167	27,798	20,916	106,947
Performance Status	90+ DPD (%)	14.6	27.1	36.5	13.1	26.1	45.4	50.9	27.9
Loss Mitigation	Modified (%)	11.4	15.3	16.4	8.5	18.8	22.2	19.3	13.4
Security	Secured (%)	100.0	19.2	74.4	71.1	100.0	22.8	74.2	76.3
	Adjusted WA LTV (%)	82.3	n.a.	n.a.	n.a.	91.2	n.a.	n.a.	n.a.

1. Consumer loans consist of non-mortgage loans to indivduals including auto loans, credit cards and term loans
2. Commercial loans consist of Corporate, CRE, SME, Leasing, Factoring, Shipping and State-Related loans

While BlackRock was able to build on the data and institutional knowledge gained during the 2011 Diagnostic, all of BlackRock's financial models used to derive CLPs for the Diagnostic Assessment were re-estimated and subject to analytical enhancements, and also benefited from a more comprehensive set of historical performance data provided by the Banks.

1.4. Key Assumptions

Definition of Credit Loss

CLPs represent undiscounted principal losses as of the Reference Date. They are based on gross loan asset balances and do not take into account existing or future provisions, bank earnings, balance sheet, and/or capital management exercises of any nature.

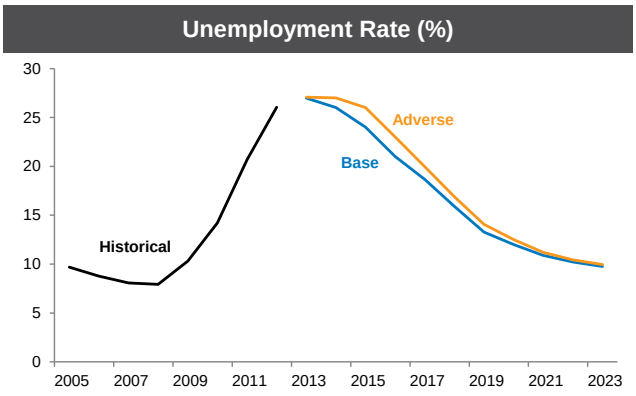
In the full version of the report, CLPs are displayed on a 3-year cumulative and lifetime basis, where the 3-year timeframe represents the period from June 2013 through June 2016. As described in Section 1.1, losses are presented both as Losses at Default as well as Losses at Realisation.

Macroeconomic Forecasts

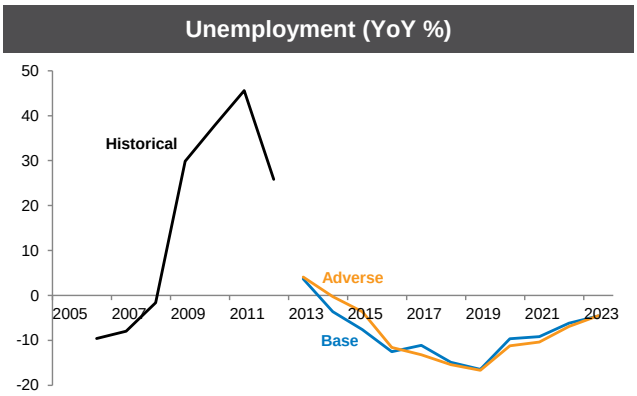
For the purposes of the Diagnostic Assessment, the Bank of Greece provided macroeconomic forecasts extending through 2050 for Base and Adverse Cases to BlackRock. They were developed by the Bank of Greece in cooperation with the Troika and comprised projections for GDP growth, unemployment, disposable income, home prices, commercial real estate prices, Swiss Franc vs. Euro (CHF/EUR) foreign exchange rate, interest rates, and inflation. The final macroeconomic forecasts were provided to BlackRock by the Bank of Greece on 14 October 2013. The following Figures show the most relevant macroeconomic forecasts used by BlackRock in the Diagnostic Assessment.

[13] Since 2011, the universe of Group A Banks has changed due to consolidation. In addition, several Banks such as ATE and Proton have formed and transferred exposures into bad banks, which are excluded from the Diagnostic Assessment. Furthermore, Piraeus has acquired the Greek operations of 3 Cypriot banks which were not within the scope of the 2011 Diagnostic. Additionally, the Greek Risk in foreign subsidiaries was not in scope for the 2011Diagnostic but is included for the Diagnostic Assessment.

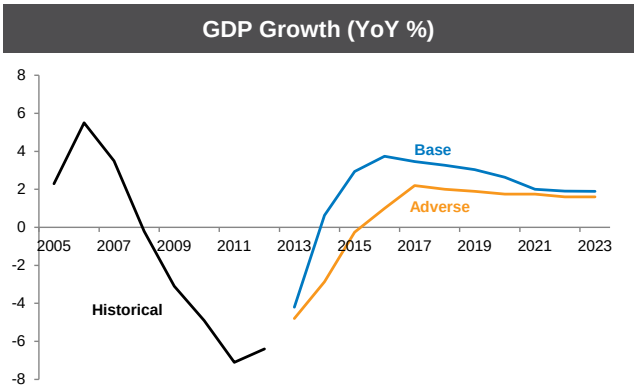
Figure 9: Macroeconomic Forecasts vs. Historical Data[14]



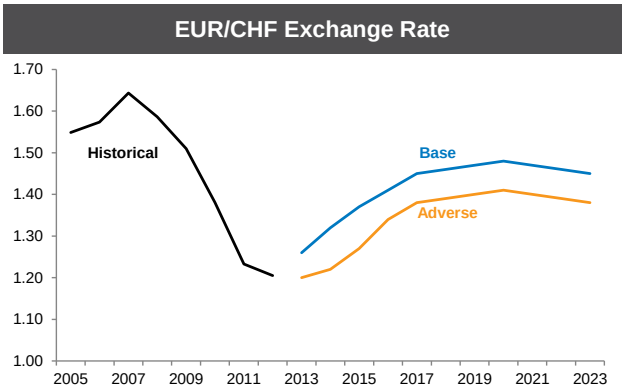
Historical data source: Hellenic Statistical Authority (EL.STAT.)



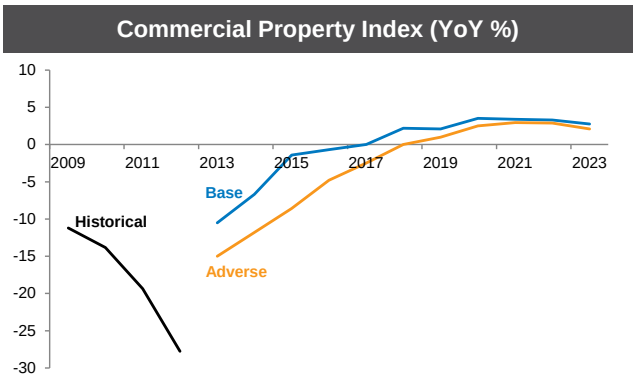
Historical data source: Hellenic Statistical Authority (EL. STAT.)



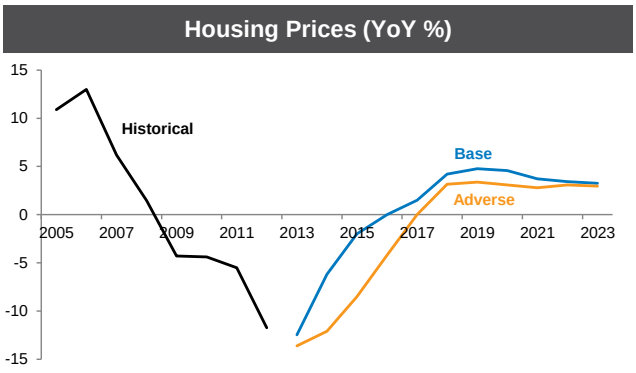
Historical data source: World Bank



Historical data source: Bloomberg



Historical data source: NAI Hellas and BlackRock



Historical data source: Bank of Greece

[14] Following a review of Greek commercial real estate fundamentals, BlackRock notes that the Commercial Property Index forecasts provided by the Bank of Greece were somewhat inconsistent with projections for other macroeconomic factors such as GDP and unemployment. The Commercial Property Index projections seemed relatively more conservative.

Figure 9 Continued: Macroeconomic Forecasts vs. Historical Data

Macroeconomic Assumption	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2023
Unemployment Rate (%) [1]	9.7	8.8	8.1	7.9	10.3	14.2	20.7	26.0							
- Base Case									27.0	26.0	24.0	21.0	18.7	15.9	9.8
- Adverse Case									27.1	27.0	26.0	23.0	20.0	16.9	10.0
GDP Growth (YoY%)	2.3	5.5	3.5	(0.2)	(3.1)	(4.9)	(7.1)	(6.4)							
- Base Case									(4.2)	0.6	2.9	3.7	3.5	3.3	1.9
- Adverse Case									(4.8)	(2.9)	(0.3)	1.0	2.2	2.0	1.6
Com. Prop. Index (YoY%)	-	-	-	-	(11.2)	(13.8)	(19.4)	(27.8)							
- Base Case									(10.5)	(6.7)	(1.4)	(0.7)	0.0	2.2	2.8
- Adverse Case									(15.0)	(11.8)	(8.6)	(4.8)	(2.5)	0.0	2.1
Housing Prices (YoY%)	10.9	13.0	6.2	1.5	(4.3)	(4.4)	(5.5)	(11.7)							
- Base Case									(12.5)	(6.2)	(2.0)	0.0	1.5	4.2	3.3
- Adverse Case									(13.6)	(12.1)	(8.5)	(4.2)	0.0	3.2	3.0
EUR / CHF Exchange Rate [2]	1.55	1.57	1.64	1.59	1.51	1.38	1.23	1.21							
- Base Case									1.26	1.32	1.37	1.41	1.45	1.46	1.45
- Adverse Case									1.20	1.22	1.27	1.34	1.38	1.39	1.38

1. At year-end
2. Average exchange rate for the period

Foreclosure Moratorium

Under a Greek interim legal provision governed by Law 3814/2010, Law 4128/2013, and Law 2251/1994, forced sales by credit and financial institutions in connection with a qualifying debt generally not greater than EUR 200,000 and secured by primary residencies, were suspended until 31 December 2009. Following successive extensions, the moratorium has remained in force and was set to expire on 31 December 2013. For the purposes of the Diagnostic Assessment, BlackRock was requested by the Bank of Greece to assume in its analysis that the foreclosure moratorium would expire on 31 December 2013.

BlackRock notes that subsequent to the submission of the original report dated 30 November 2013, the Greek Parliament approved an extension of the foreclosure moratorium for qualifying loans based on, but not limited to, borrower annual income, net household income, employment status, size of family and potential disabilities, to be effective until 31 December 2014. Due to the timing of this announcement, the one-year extension was not included in the results of the final report submitted on 30 November 2013. However, as noted in Section 1.1(B), per the request of the Bank of Greece, BlackRock performed a series of follow-up sensitivity analyses, which included a scenario where the foreclosure moratorium was assumed to be extended until 31 December 2014.

State-Related Guarantees and Collateral

In addition to its remaining holdings in Greek Government Bonds ("GGB"), the Greek banking sector also has significant exposure to loans that are intrinsically linked to the performance of the Greek State. For the purposes of the Diagnostic Assessment, BlackRock was requested by the Bank of Greece to assume that the Greek State will fully meet its obligations.

It is important to note that BlackRock does not express a view on the determination or ability of the Greek State to make payments on guaranteed exposures or to support state owned/affiliated entities. The assumptions provided by the Bank of Greece to derive the CLPs on State-Related loans are purely working assumptions, and do not express an opinion on the ability of the Greek State to meet its obligations, which is outside the scope of the Diagnostic Assessment.

1.5. Important Assumptions and Limitations

The main objective of the AQR and CLP exercise was to obtain an understanding of the Banks' portfolios and procedures and to estimate credit loss projections across each asset class and each Bank as of the Reference Date.

The work was undertaken in a compressed timeframe and is subject to certain limitations, including those related to the quality and sufficiency of data received, including from the Banks, as well as other considerations and limitations as described in the Advisory Services Agreement, dated 17 July 2013, between BlackRock and the Bank of Greece. For example, the verification and validation of data, documentation, analyses and other work product provided by the Banks or by the external vendors and consultants listed in Section 1.1 was beyond the scope of the Diagnostic Assessment, and BlackRock did not undertake the independent confirmation of such information.

The LFR for Residential, Consumer, SBP and SME loans forming part of the AQR was based on a small, risk-based and non-representative sample of loan exposures selected from each of the Banks' portfolios. Therefore, any quantitative or qualitative results derived by BlackRock cannot and should not be extrapolated to apply to the entire portfolio from which the sample was taken or to the respective Bank. While the Large Loan underwriting review did cover a significant percentage of the Large Loan universe, it too was based on a risk-based sample and was non-representative of the broader Commercial portfolios, and its results should not be extrapolated to apply to the entire portfolio from which the sample was taken or to the respective Bank. In general, the results summarised in this report should be interpreted as directional and indicative in nature only. They should only be assessed in conjunction with the results from other qualitative and quantitative processes performed as part of the AQR including, among others, the management due diligence sessions, documentation review, data analysis and collateral valuations.

As such, this report intends to cover what BlackRock believes are some of the key findings related to the AQR and CLP workstreams, based on the available information, the limitations mentioned herein and within the requested project timeframe.

Residential Mortgage Loans

2.1. Scope of Asset Quality Review

As of 30 June 2013, Residential Mortgage loans totalled EUR 63.9 BN across Group A Banks and EUR 6.0 BN across Group B Banks. The purpose of Asset Quality Review (AQR) was to provide an assessment of the assets held by each Bank and to gather qualitative information regarding the Banks' lending practices, portfolio monitoring and workout procedures. BlackRock assessed Residential Mortgage loan asset quality through the following processes:

- Conducted management due diligence sessions to review and discuss Bank history, product types, origination strategy, portfolio performance, loss mitigation practices, and collateral valuation and recovery efforts
- Reviewed loan-level and collateral-level portfolio data for Group A and Group B Bank data as of 30 June 2013. For Group A Banks, BlackRock also conducted an in-depth analysis of 5 year historical performance data, which was used to model probabilities of defaults
- Directed an independent LFR covering a sample of Group A residential mortgage loan files. The goal of the exercise, which was performed by Clayton and reviewed by BlackRock, was to assess the credit files and evaluate origination practices and refinancing/restructuring procedures. A total of 569 residential loan files were reviewed, consisting of 400 loan files selected from Group A Parent Bank portfolios and 169 loan files from entities that were recently acquired by the Group A Banks. This also included the 200 residential mortgage LFRs performed as part of the TAR exercise
- Commissioned and analysed over 500 independent drive-by valuations on residential properties across the Group A Banks to test for potential biases in the internal Bank valuations and the official home price indices across factors such as property size, property type and origination date
- Conducted research and consulted external sources to inform model projections and calibrate models, where necessary. For example, BlackRock engaged Greek external legal counsel to inform views on the enforceability of pre-notations, the foreclosure moratorium, and the auction process in Greece

These qualitative and quantitative factors served as inputs to inform BlackRock probability of default and loss given default models developed to generate CLP results.

The due diligence process for Group A Banks included an original request for information (RFI) sent to each Bank prior to management due diligence sessions, loan-level data requests, and follow-up RFIs if necessary. The Residential Mortgage Loan RFI covered the following main areas:

- Lender profile and organisational history
- General product features and portfolio stratifications
- Origination and underwriting strategies
- Credit review and monitoring processes
- Loan payment collection and servicing operations
- Loss mitigation strategies
- Historical defaults
- Credit performance projections
- Collateral valuation and recovery practices, including impact of the foreclosure moratorium
- Status of any merger integrations, including the effects on banking practices and data systems

Full-day due diligence sessions were held with management teams at each Group A Bank to cover all Residential Mortgage and Consumer Loans Products, while one-day due diligence sessions were held to discuss both Retail and Commercial asset classes for the Group B Banks. In addition to the above listed RFI

topics covered during management presentations, BlackRock also requested the following specific documentation to be submitted by each Group A and Group B Bank:

- Detailed loan-level data submission
- Product type descriptions
- Detailed summaries of the residential mortgage loan portfolio by various risk metrics
- Loan underwriting and credit approval documentation
- Schedule of historical payment status
- Bank organisational structure for residential mortgage loan underwriting, loan servicing, and payment collection department
- Description of specialised Residential Mortgage loan products

If any information was unclear or incomplete from the due diligence sessions or data submissions, BlackRock submitted written follow-up RFIs, exchanged emails with relevant Bank employees, and held follow-up calls, where necessary. The follow-ups with the Banks spanned ten weeks and served to clarify any questions regarding the data submission and check for inconsistencies and data gaps. The ongoing dialogue was critical to gaining a thorough understanding of the data submissions. Similarly, model construction, calibration, and assumption-setting were all informed by these ongoing communications with the Banks regarding local Greek practices and Bank strategy.

2.2. Portfolio Stratifications and Risk Analysis

Data Collection and Review

BlackRock developed a standardised loan-level data template tailored to Greek Residential Mortgages, which included over 110 data fields covering, but not limited to, the following areas:

- Borrower characteristics – Unique identifier[15], employment, income, borrower city, etc.
- Loan characteristics – Balance, origination date, coupon structure, remaining term, LTV, etc.
- Current and historical performance - Current and historical arrears status, arrears balance, current and historical loan modification status, etc.
- Collateral information - Collateral location, collateral type, origination appraisal, lien information, etc.

Upon receipt of Bank submissions, BlackRock downloaded and on-boarded the datasets to a database system, which facilitated the organisation and harmonisation of data across various output formats (i.e., .txt, .xls, etc.) enabling the creation of portfolio stratifications, data gap reports, and the implementation of data overrides and assumptions. The original data submissions by the Banks varied in the level of completeness, and over the course of several weeks, BlackRock and the Banks engaged in a comprehensive data reconciliation process.

BlackRock produced detailed stratification tables in a standard format and compared these tables to summary tables provided by each of the Banks to enable further corroboration of balances and other key risk factors. This process allowed the Banks to acknowledge that the data supplied to BlackRock was consistent with the Banks' own understanding of their respective portfolios. Inconsistencies were addressed via iterative data re-submissions, email correspondence, teleconferences, as well as in-person meetings. Reconciliations of differences were performed subject to materiality and to the extent practical, within the limited timeframe during which the analysis was conducted.

[15] For Banks that had recently acquired institutions (Alpha, NBG and Piraeus), BlackRock requested a unique identifier for exposures in the parent Bank and the acquired entities

Data Assumptions

Following the data reconciliation process, some data deficiencies remained, the extent of which varied across Banks. Incomplete or inconsistent data necessitated, for modelling purposes, the application of practical working assumptions to complete the dataset. These working assumptions were informed by observations from the overall dataset, qualitative knowledge extracted from the AQR due diligence sessions, as well as BlackRock's judgment based on Greek-specific experience.

Figure 10: Selected Data Gap Assumptions

Missing Field	Data Assumptions
Origination date	Assumed Bank's Weighted Average Seasoning Term
LTV	Assigned to Bank's WA LTV by Loan Origination Date bucket
Postal code	Assigned to Geographic Location "Other" category
End date for loans still in Forbearance	Assigned to Bank's WA Forbearance End Date
End date for loans still in IO	Assigned loan maturity date as IO end date
Maturity date	Assigned maturity date based on time since origination date and loan remaining term
Modification flag missing	Assumed loan was not Modified
Modification date	Assumed Bank's WA Seasoning Term for Modified loans
Current interest rate	Assigned Bank's WA interest rate by product type
Interest rate type	Assigned to Floating
Most recent collateral valuation date	Assumed most recent collateral valuation was as of 31 December 2012
Geographic location (based on Postal Code)	Assigned based on combination of available data in collateral and borrower data files (Athens, Thessaloniki, Other)

In addition to assumptions made to produce a more complete dataset, BlackRock also developed new fields through adjusting and supplementing Bank-provided data. These additional fields expanded the list of portfolio characteristics available to BlackRock for further analysis, and include the following:

Figure 11: Selected Calculations Performed to Enhance Data Set

Calculated Fields	Calculation
Seasoning term	• For loans that have not been Modified, difference between origination date and 30 June 2013, measured in months • For Modified loans, the difference between modification date and 30 June 2013, measured in months
Remaining term	• Number of months between Maturity Date and 30 June 2013, or; • Subtracted number of months since loan origination from loan term

Data Mapping and Standardisation

Despite universal field definitions, the degree of format variability for certain Bank responses within key fields necessitated the standardisation of those fields' contents in accordance with a BlackRock-developed mapping framework (NB: relative to other assets classes, data format variability tends to be particularly high for Retail). This step was performed with consideration for the need to preserve data granularity.

Fields for which data mapping was required included collateral region, coupon type, and delinquency status. In these cases, BlackRock constructed a more concise range of labels/field contents, and based upon the original Bank responses, assigned existing line items to the labels within the smaller sub-set.

Portfolio Overview and Summary Statistics

The Group A Bank Residential Mortgage universe encompassed EUR 63.9 BN of funded exposure across more than 1.2 million loan IDs and 850 K borrowers. NBG and Alpha have the largest share of Residential Mortgage exposures, with EUR 18.7 BN and EUR 18.3 BN in total funded balances respectively, each representing approximately 29% of the total. Piraeus follows closely with a EUR 17.3 BN funded balance (27% of the total), and Eurobank is the smallest constituent, with a EUR 9.6 BN funded balance, representing 15% of the universe.

Figure 12: Group A Banks Residential Mortgage Universe

	Balance		Loan Count		Borrower Count	
	Loan Balance (EUR MM)	% of Total Balance	Loan Count	% of Total Count	Borrower Count	% of Total Count
Alpha	18,338	29%	304,741	25%	207,821	24%
Eurobank	9,563	15%	131,128	11%	98,690	12%
NBG	18,676	29%	452,771	37%	302,852	35%
Piraeus	17,322	27%	340,470	28%	246,855	29%
Total	**63,899**	**100%**	**1,229,110**	**100%**	**856,218**	**100%**

The table in Figure 13 below contains an overview of key characteristics and risk metrics of Residential Mortgage exposure across the entire Group A Banks universe, side-by-side and relative to the Group A average. It features key risk metrics such as Indexed LTV, performance status and the percentage of loans which are CHF-denominated or, Government Guaranteed.

Figure 13: Overview of Group A Bank Residential Mortgage Portfolios

		Alpha	Eurobank	NBG	Piraeus	Group A Total	Group A Avg.
Portfolio Exposure	Funded (EUR MM)	18,338	9,563	18,676	17,322	63,899	
Performance Status	Current (0-89 DPD, %)	65.2	84.1	72.4	79.1		73.8
	Delinquent (90-359 DPD, %)	3.9	3.5	10.1	5.8		6.2
	Defaulted (360+ DPD, Denounced, %)	30.9	12.4	17.5	15.1		20.0
	360+ DPD (%)	*16.6*	*2.5*	*6.8*	*2.0*		*7.7*
	Denounced (%)	*14.3*	*9.9*	*10.8*	*13.1*		*12.3*
	Adjusted 90+ DPD[1] (%)	43.6	33.5	40.9	38.6		39.9
Loss Mitigation	Total Loss Mitigation	8.9	19.2	24.7	22.5		18.7
	Modified, Current (0-89 DPD, %)	*8.7*	*17.5*	*13.3*	*17.7*		*13.8*
	Modified, Delinquent (90+ DPD, Denounced %)	*0.2*	*1.7*	*11.4*	*4.8*		*4.9*
Loan Characteristics	Number of Borrowers (K)	207.8	98.7	302.9	246.9	856.2	
	Number of Loans (K)	304.7	131.1	452.8	340.5	1,229.1	
	Average Loan Size (EUR K)	60.2	72.9	41.2	50.9		52.0
	WA Coupon (%)	3.0	2.2	3.1	3.4		3.0
	WA Seasoning Term (Months)[2]	73.5	63.5	62.2	53.7		63.3
	WA Indexed LTV (%)	83.0	85.1	78.1	71.1		78.6
	WA Adjusted Indexed LTV[3] (%)	98.3	99.1	88.4	82.4		91.2
	CHF (%)	1.6	38.9	4.0	7.9		9.6
	Government Guaranteed (%)	1.1	0.2	6.9	0.0		2.4

1. Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been modified

2. Seasoning term is defined as months since modification date for modified loans and months since origination for non-modified loans

3. LTV implied by property valuations indexed to June 30, 2013, and subsequently adjusted as informed by the drive-by valuation results

- The aggregate percentage of 90+ DPD and denounced balances across all Group A Banks was approximately 26%, while loss mitigation was performed on 18.7% of the total universe. The presence of CHF-denominated loans was sizeable, at 9.6% of total balance, and only 2.4% of balances were associated with a Greek government guarantee. The weighted average seasoning (adjusted for months since modification date for Modified loans) of Residential Mortgages was 63 months
- The weighted average drive-by Adjusted Indexed LTVs ranged from the 82% to 99% across the Group A Banks, with Eurobank having the highest Adjusted Indexed LTV and Piraeus the lowest. Adjusted Indexed LTV is a key driver of default and loss severity
- NBG and Piraeus were the two Banks with the largest percentage of loss mitigation performed to-date. Notably, while Alpha has confirmed its current adherence to an internal policy of reflecting and recording the presence of loss mitigation on Modified exposures, in particular rescheduled exposures, there is still some level of ambiguity regarding the extent to which this data management practice was performed in the past. As such, the loss mitigation metric, as a measure intended to quantify the prevalence of loan modifications within each Bank, may be somewhat inconsistent for comparative purposes when considering Alpha

BlackRock utilised data stratifications analysis to facilitate the identification of key patterns and credit risk drivers within the portfolio. Observed risk drivers and patterns were analysed and reviewed in detail alongside the findings from other AQR due diligence processes. Below is a brief walkthrough demonstrating how the iterative stratification highlights the significance of one particular metric (in this case, Adjusted Indexed LTV) in relation to credit performance. The following two tables in Figure 14 show a side-by-side comparison of loan characteristics and risk metrics of the Group A Bank Residential Mortgage universe with drive-by Adjusted Indexed LTVs less than and greater than 90%.

Figure 14: Residential Loan Stratifications

1 The table below shows stratifications of all Group A Bank Residential Mortgage exposure with a drive-by Adjusted Indexed LTV ≤ 90%.

		Alpha	Eurobank	NBG	Piraeus	Group A Total	Group A Avg.
Portfolio Exposure	Funded (EUR MM)	8,805	4,190	9,895	10,485	33,376	
Performance Status	Current (0-89 DPD, %)	76.6	89.8	83.7	85.2		83.1
	Delinquent (90-359 DPD, %)	4.0	2.8	7.3	4.7		5.0
	Defaulted (360+ DPD, Denounced, %)	19.4	7.4	9.0	10.1		11.9
	360+ DPD (%)	*13.1*	*1.9*	*4.4*	*1.6*		*5.5*
	Denounced (%)	*6.2*	*5.5*	*4.6*	*8.5*		*6.4*
	Adjusted 90+ DPD[1] (%)	31.2	23.8	26.5	30.4		28.6
Loss Mitigation	Total Loss Mitigation	8.1	14.5	15.2	19.1		14.4
	Modified, Current (0-89 DPD, %)	*7.9*	*13.6*	*10.2*	*15.6*		*11.7*
	Modified, Delinquent (90+ DPD, Denounced %,	*0.2*	*0.9*	*5.0*	*3.5*		*2.7*
Loan Characteristics	Number of Borrowers (K)	143.3	69.7	243.0	207.4	663.4	
	Number of Loans (K)	192.9	88.3	330.7	274.3	886.2	
	Average Loan Size (EUR K)	44.2	47.5	29.9	38.2		37.3
	WA Coupon (%)	3.1	2.4	3.3	3.6		3.2
	WA Seasoning Term[2]	77.7	72.7	73.3	59.7		70.0
	WA Indexed LTV (%)	49.4	50.2	52.0	49.9		50.5
	WA Adjusted Indexed LTV[3] (%)	58.7	57.5	58.2	56.7		57.8
	CHF (%)	0.7	22.3	1.3	3.3		4.4
	Government Guaranteed (%)	1.2	0.1	10.0	0.0		3.3

1. Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been modified
2. Seasoning term is defined as months since modification date for modified loans and months since origination for non-modified loans
3. LTV implied by property valuations indexed to June 30, 2013, and subsequently adjusted as informed by the drive-by valuation results

2 The table below shows stratifications of all Group A Bank Residential Mortgage exposure with a drive-by Adjusted Indexed LTV > 90%.

		Alpha	Eurobank	NBG	Piraeus	Group A Total	Group A Avg.
Portfolio Exposure	Funded (EUR MM)	9,533	5,373	8,781	6,837	30,523	
Performance Status	Current (0-89 DPD, %)	54.6	79.6	59.6	69.8		63.8
	Delinquent (90-359 DPD, %)	3.8	4.1	13.3	7.4		7.4
	Defaulted (360+ DPD, Denounced, %)	41.6	16.3	27.2	22.8		28.8
	360+ DPD (%)	*19.9*	*3.0*	*9.4*	*2.6*		*10.0*
	Denounced (%)	*21.8*	*13.2*	*17.7*	*20.2*		*18.8*
	Adjusted 90+ DPD[1] (%)	55.0	41.0	57.2	51.3		52.3
Loss Mitigation	Total Loss Mitigation	9.7	22.9	35.4	27.7		23.5
	Modified, Current (0-89 DPD, %)	*9.5*	*20.6*	*16.8*	*21.0*		*16.1*
	Modified, Delinquent (90+ DPD, Denounced %)	*0.2*	*2.3*	*18.7*	*6.7*		*7.3*
Loan Characteristics	Number of Borrowers (K)	64.6	32.7	67.3	43.4	207.9	
	Number of Loans (K)	111.9	42.8	122.0	66.2	343.0	
	Average Loan Size (EUR K)	85.2	125.4	71.9	103.3		89.0
	WA Coupon (%)	2.8	1.9	2.8	3.2		2.7
	WA Seasoning Term (Months)[2]	69.7	56.3	49.7	44.5		56.0
	WA Indexed LTV (%)	113.0	112.3	107.6	103.6		109.2
	WA Adjusted Indexed LTV[3] (%)	133.7	131.5	122.3	121.7		127.4
	CHF (%)	2.4	51.9	7.0	15.0		15.3
	Government Guaranteed (%)	1.1	0.2	3.4	0.0		1.3

1. Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been modified
2. Seasoning term is defined as months since modification date for modified loans and months since origination for non-modified loans
3. LTV implied by property valuations indexed to June 30, 2013, and subsequently adjusted as informed by the drive-by valuation results

From above stratifications, the following observations can be made

- Loans that had an Adjusted Indexed LTV of less than 90% were 83.1% Current (0-89 DPD), compared to only 63.8% for loans with an Adjusted Indexed LTV greater than 90%

- The Adjusted 90+ DPD ratio (which encompasses loans 90+ DPD and loans which are Current and have been Modified) is only 28.6% for Loans with an Adjusted Indexed LTV of less than 90% compared to 52.3% for loans with an Adjusted Indexed LTV greater than 90%
- Loans with an Adjusted Indexed LTV greater than 90% had an average loan size of EUR 89.0 K compared to EUR 37.3 K for loans with an Adjusted Indexed LTV of less than 90%

BlackRock tested the significance of Indexed LTV, among other variables, when determining the model factors and drivers.

2.3. Loan File Review

Residential Loan file reviews were based on small samples when compared to the total portfolio size and selected according to sampling criteria presented in the following paragraphs. Therefore, any quantitative or qualitative results derived by BlackRock should not be extrapolated to apply to the entire portfolio from which the sample was taken. Results should be interpreted as directional and indicative in nature only. They should also only be assessed in conjunction with the results from other qualitative and quantitative processes performed during the AQR process.

BlackRock engaged Clayton to perform 2 separate reviews on a sample of residential mortgage loan files to assess each Bank's (i) origination and underwriting practices; and (ii) loss mitigation practices.

Origination and Underwriting Residential Loan File Review

The origination and underwriting review was based on a sample of 369 files that covered all Group A Parent Bank portfolios and selected portfolios for recently acquired entities for each Group A Bank. Loan file reviews were conducted for two purposes: (i) to assess whether loans were originated in accordance with underwriting criteria in effect at the time of origination, or if subject to exceptions, such exceptions were deemed to have sufficient compensating factors; and (ii) to assess whether the loans, beyond their adherence to criteria or exceptions, would be considered acceptable to a prudent lender.

The scope of Clayton's assignment included providing the following services:

- Review of loan files including:
  - Application form
  - Authorised broker checks, as applicable
  - KYC documentation
  - Credit search/score where applicable and Teiresias check
  - Confirmation of income
  - Debt transfer – last monthly statement for transferred loans
  - Official list of properties owned
  - Valuation report
  - Loan-to-Value (LTV) calculation and DTI/ affordability model
  - Pre-Credit Agreement contract (pre-approval) setting out the pricing conditions
  - Copy of House Contract
  - Confirmation documents and topographic diagram proving property was built legally and within planning consents or license obtained from state building and construction authority prior to the construction of any new property
  - Solicitor's Legal Audit report on the 'to be pledged' property
  - Underwriter notes if any – justification of decision if outside lending criteria and guidelines
  - Court order confirming property pre-notation or legal mortgage
- Loan evaluation and grading assessment
- Aggregate, and Bank-specific summary reports, including detailed loan file data worksheets, and reviewer commentary

Sample Selection

Loans samples were determined through pre-defined criteria as well as random selection. For each Group A Parent Bank, government-guaranteed and Modified loans were excluded from the sample selection. Minimum selection criteria were as follows:

- 14 loans (28% of sample) with most recent LTV > 80%
- 14 loans (28% of sample) with arrears of over 90 DPD
- 10 loans (20% of sample) with current balance over EUR 200 K
- 12 loans (24% of sample) with random selection

The same methodology was applied for acquired Group B Bank entities, adjusted to the size of their own sample sets.

The loan balances reviewed across Group A Parent Banks and recently acquired Group B Bank entities are as follows:

Figure 15: Loan Balances Reviewed in Sample

Bank	Number of files reviewed	Outstanding balance (EUR MM)
Parent Entities	**200**	**22.11**
NBG	50	6.27
Eurobank	50	4.96
Alpha	50	5.09
Piraeus	50	5.79
Recently Acquired Banks	**169**	**18.25**
Probank (NBG)	5	0.45
TT (Eurobank)	20	2.50
Emporiki (Alpha)	50	5.22
ATE (Piraeus)	36	2.96
Cypriot Banks[1] (Piraeus)	26	2.75
Millennium (Piraeus)	16	2.99
Geniki (Piraeus)	16	1.38
Total	**369**	**40.36**

1. Includes Bank of Cyprus, Cyprus Popular Bank and Hellenic Bank

Review Process

Clayton provided grades for each loan reviewed on two distinct measures:

1. Criteria Grade – measures compliance with stated underwriting guidelines in effect at loan origination, accounting for any mitigating factors that may offset any guideline exceptions.

Criteria Grade	Criteria Grade Description
A	No exceptions to guidelines or origination documents were noted. The loan was considered to be underwritten in accordance with guidelines
B	Minor exceptions to guidelines or documents were noted. However, the nature of the exceptions was such that the loan would be considered in adherence with policy

Criteria Grade	Criteria Grade Description
C	One or more material exceptions to guidelines or documents were noted. However the loan had mitigating or compensating factors that would make the loan deemed as an acceptable risk
D	One or more material exceptions to guidelines or documents were noted. There were insufficient mitigating or compensating factors to offset the exceptions, and the granting of loan would have been considered at a level of risk outside of policy

2. Consultant Grade - overall grade measuring whether loan origination standards conform to generally accepted lending practices adopted by a prudent lender.

Consultant Grade	Consultant Grade Description
A	No exceptions to generally accepted practice by prudent Residential Mortgage / consumer lenders of like product were noted. The loan was considered to be acceptable
B	Minor exceptions to generally accepted practices were noted. However, the nature of the exceptions was such that the loan would be considered acceptable by prudent Residential Mortgage lenders of like product in the market
C	One or more material exceptions to generally accepted practices were noted. However the loan had mitigating or compensating factors that would have allowed prudent Residential Mortgage lenders of like product in the market to consider the loan to be acceptable on balance
D	One or more material exceptions to generally accepted practices were noted. There were insufficient mitigating or compensating factors to offset the exceptions and the loan would be considered unacceptable by prudent lenders in the market

Summary Findings

The results of the Origination and Underwriting LFR are shown in the Figure below[16]. Reviewers did not have policy or procedure manuals during the review for TT and Probank and therefore could not assign a Criteria Grade for those banks.

Figure 16: Residential Origination and Underwriting LFR results

Residential	Criteria Grades (% of Loan Count)				Consultant Grades (% of Loan Count)			
	A	B	C	D	A	B	C	D
Average of Parent Entities	35%	20%	21%	25%	11%	18%	32%	40%
Average of Acquired Banks	46%	11%	18%	19%	15%	31%	23%	31%
Total	**40%**	**19%**	**19%**	**22%**	**13%**	**24%**	**27%**	**36%**

When assigned a grade on their overall adherence to stated guidelines, 59% of the sample loans in the 10 Banks received a Criteria Grade of either A or B, indicating that the Banks tended to have procedures that promoted compliance with the policy criteria. However, this is offset by the 22% of sample loans with exceptions outside of the stated policies that were deemed unacceptable. In addition, only 37% of the sample

[16] Excluding Criteria Grades for TT and Probank, as reviewers were not provided with procedure or policy manuals for these banks

loans received a Consultant Grade of either A or B for being underwritten in accordance with prudent lending standards, while an almost equal amount of the sample (36%) received a Consultant Grade of D for having been originated despite exceptions of which a prudent lender would not approve.

Clayton noted several exceptions during the loan file reviews, and based on those exceptions, assigned the aforementioned grades. There were 8 categories of exceptions, which are listed below, along with associated examples:

- Income and affordability: Income not verified or employment status/time in job unknown for borrower and/or co-borrower and/or guarantor, DTI limit exceeded, DTI calculated by consultant exceeds limit, total income not reasonable or not assessable, other income/affordability issues
- Application and buildings insurance (Bins): Application not signed or outdated (by over 6 months), borrower(s)/guarantor age issue, compulsory insurance issue, credit not declared in application, debt transfer documents missing, guarantor relationship unknown, marital status related issues, mortgage purpose not stated or not within criteria, non-disclosed income issues, old account conduct not (properly) assessed, property declaration form (E9) missing, credit not declared, other application issues
- Valuation: Adverse findings related to property, LTV at origination issue, new build issues, only internal valuation in file, planning consent issue, valuation missing or not signed or pre-dates application or is not accompanied by photos, other valuation issues
- Know Your Customer (KYC): Signatures and/or date of birth inconsistent within documents, ID issues, no evidence of right to reside in EU, proof of address missing, other KYC issues
- Credit search: Adverse showing on credit search (black and/or white Teiresias), pre-approval search missing, secondary search prior to completion missing, other credit search issues
- Contract and legal: Issues with collateralised asset, court order and pre-notation documents missing, land registry certificate missing, legal inspection report missing, name or address or liens incorrect, legal documents for new build missing, pre-notated amount issue, purchase or existing owner contract missing, other contract or legal issues
- Other underwriting issues: Miscellaneous origination issues

Across the aforementioned categories, there were 1,293 exceptions noted. These exceptions noted are summarised in the following table:

Figure 17: Exceptions Observed in Residential Origination and Underwriting Loan File Review

Exception Category	Criteria Exceptions	Consultant Exceptions	Total
Income and Affordability	201	343	544
Application and Bins	85	165	250
Valuation	30	166	196
KYC	44	68	112
Credit Search	36	70	106
Contract and Legals	19	63	82
Underwriting	-	2	2
Guarantor	-	1	1
Total	**415**	**878**	**1,293**

The results of the LFR identified fewer criteria-based exceptions than exceptions that the reviewer believed were exceptions to prudent lender standards. The Criteria Exceptions related to violation of the Bank's own policies, primarily related to income and affordability assessment (201 exceptions, of which nearly 50% were criteria-related). Exceptions related to compliance with application and buildings insurance policy were also observed in 85 cases.

Consultant Exceptions were more frequent that Criteria Exceptions. Most Consultant Exceptions relate to the lack of a consistent approach to borrower income and affordability assessment, with 343 of these exceptions

observed. Most of these exceptions (40% of this category's exceptions) relate to the assessment of income/DTI and breaches of reasonable DTI limits (primarily related to loans originated during the high lending growth period). Examples of this include the use of non-declared income and credit commitments from other banks that were not included in the borrower's total debts when calculating the DTI ratio. Omission of the borrower's employment status and time on the current job were also observed in 94 cases (which represents 25% of the category's exceptions).

Exceptions related to the valuation process were noted in 166 cases. The most frequent issue observed was the lack of photographs of properties, which were missing from 58 loan files. High LTVs at origination were also noted in 33 cases, mostly for loans originated during the 2005-2009 period during which financing was approved for up to 100% of property market value.

Incomplete application documentation, pertinent data, or building insurance issues was noted in 165 instances. Exceptions related to borrower(s) or guarantor(s) age were identified in 80 instances, and 23 loan applications were outdated (over 6 months) or not signed.

Inadequate credit search practices were noted in 70 instances, with the most frequent exception being the absence of a pre-approval credit search (30 cases). In 29 cases, the credit underwriters disregarded or insufficiently assessed adverse Teiresias (both 'white' and 'black' list[17]) credit search results.

KYC-related exceptions were identified in 68 cases, primarily due to insufficient proof of address and inconsistent signatures across the documentation. Proof of address was missing from 34 files. Since 2008, banks have had to implemented strict criteria to validate the borrower's address in order to comply with introduced regulation. Prior to that date, it was common practice for lenders to use tax documents as proof of address. However, tax documents are not be the best source of address information, as many list alternate addresses on these forms. Mismatches in signatures often resulted when the signature samples provided (e.g., IDs) were issued a decade or more prior to loan application. In those instances, signature validation was done through comparison with more recent documents, such as tax declaration forms.

Finally, 63 exceptions were noted related to contract and legal issues, with the most frequent observation being the absence of purchase/current owner's contract in 28 files. It is also noteworthy that the LFR identified a standard practice among banks that allowed the borrower to state a lower price on the purchase contract than the actual purchase price agreed upon with the seller of the property. The Banks would typically approve a loan for 'purchase and repairs' with two disbursements, one for the 'purchase price' and an additional disbursement for 'repairs' granted the same day. Additionally, the review found instances where construction was undertaken outside planning consent or without licenses obtained from the appropriate state building and construction authorities.

Loss Mitigation Residential Loan File Review

This review formed part of BlackRock's Troubled Asset Review ("TAR") and encompassed a sample of 50 Residential Mortgages for each of the 4 Group A Parent Banks. This review assessed whether loss mitigation actions (i.e., forbearance, refinancing, rescheduling, or restructuring) were undertaken with or without a rationale consistent with that of a prudent lender (as it relates to areas such as borrower affordability and willingness and/or ability to pay) and if, subject to exceptions, such exceptions were generally in line with those of a prudent lender.

[17] Teiresias credit bureau offers a 'white list' containing also good payers since 2003 – in addition to the 'black list' service that was offered prior to that date.

Sample Selection

Loans samples were determined through pre-defined criteria as well as random selection to gain insight into each Bank's loss mitigation practices. Government-guaranteed and government-subsidised (OEK) loans were excluded from this sample. The sample was comprised exclusively of loans Modified in 2012 and 2013. Reviewed samples complied with the following criteria:

- 19 loans (38% of sample) with arrears lower than 90 DPD and size less than EUR 200 K
- 19 loans (38% of sample) with arrears over 90 DPD and size less than EUR 200 K
- 6 loans (12% of sample) with arrears lower than 90 DPD and size over EUR 200 K
- 6 loans (12% of sample) with arrears over 90 DPD and size over EUR 200 K

The loan balances reviewed per Group A Parent Bank are as follows:

Figure 18: Loan Balances Reviewed in Sample

Bank	Number of files reviewed	Outstanding balance of reviewed loans (EUR MM)
NBG	50	5.68
Eurobank	50	5.59
Alpha	50	5.23
Piraeus	50	5.87
Total	**200**	**22.37**

Review Process

Each case was given a different grade by the reviewer based on exceptions in the following manner:

Grade	Grade Description
A	No exceptions to guidelines, documents or, as applicable, generally accepted practice by prudent Residential Mortgage lenders, of like product in the market were noted. The loss mitigation solution offered is considered to be acceptable
B	Minor exceptions to guidelines, documents or, as applicable, generally accepted practices were noted. However, the nature of the exceptions was such that the loss mitigation would be considered acceptable by prudent Residential Mortgage lenders of like product in the market
C	One or more material exceptions to guidelines, documents or, as applicable, generally accepted practices were noted. However the loss mitigation solution offered had mitigating or compensating factors that would allow prudent Residential Mortgage lenders of like product in the market to consider the loan to be acceptable on balance
D	One or more material exceptions to guidelines, documents or, as applicable, generally accepted practices were noted. There were insufficient mitigating or compensating factors to offset the exceptions and the loan would be considered unacceptable by prudent lenders of like product in the market

Summary Findings

The results of the Loss Mitigation Loan File Review are shown in the Figure below:

Figure 19: Residential Loss Mitigation Loan File Review Results

	Grade			
Bank	**A**	**B**	**C**	**D**
Total Average	4%	11%	8%	77%

Upon review, only 16% of the loan sample received a grade of either A or B, indicating that the Banks generally did not adhere to stated loss mitigation procedures or practices generally accepted by prudent lenders for similar products. Furthermore, 77% of the sample loans that received loss mitigation workouts were deemed unacceptable and were outside of the prudent lending standards. These scores are lower than the ones attributed during the AQR Residential Mortgages LFR which is primarily due to a more adverse selection of this sample.

A total of 913 exceptions were noted from the review. Reviewers categorised these exceptions into 3 main categories, each of which has several sub-categories, as follows:

- Post completion evident risk: Arrears likely to increase post-modification, issues related to the borrower's performance for other accounts, affordability and other debt assessment issues, borrower's unemployment status, other lender litigation, exchange rates, high LTVs, borrower or guarantor being deceased or untraceable, sensitive issues (mostly health problems and borrower's age at loan maturity) and other risks/issues
- Restructuring: Includes exceptions related to accounts likely to default after modification, restructuring/modification activities not being successful or appropriate, reasonable, or favourable for the borrower, presence of multiple modifications per loan, payment history not being assessed prior to modification, arrangements with other lenders, loan agreement addendum not in file and other restructuring related issues
- Payment performance and collections: Including exceptions related to no or not effective dialogue with borrowers, collections activities not timely or not in accordance with SLA, not established reasons for arrears, unknown intention to pay and other collections issues

The various exceptions, by category, are listed in the following table.

Figure 20: Exceptions Observed in Residential Loss Mitigation Loan File Reviews

Residential loss mitigation Exceptions	
Exception sub-category	**Total**
Post completion evident risk	**486**
• *Arrears likely to increase*	*125*
• *Other accounts performance*	*95*
• *Affordability or other debt issues*	*83*
• *Borrower unemployed*	*56*
• *Exchange rate issues*	*30*
• *Other exceptions (in 11 sub-categories)*	*97*
Restructuring	**387**
• *Account likely to default after restructuring/modification*	*111*
• *Restructuring/modification activities not successful*	*97*
• *Restructuring/Modification not appropriate, not reasonable, not within criteria or not all options considered*	*81*
• *Multiple restructurings/modifications per loan*	*70*
• *Other exceptions (in 4 sub-categories)*	*28*
Payment performance and collections	**40**

Residential loss mitigation Exceptions	
Exception sub-category	**Total**
• *No dialogue with borrowers or dialogue not effective*	*27*
• *Other exceptions (in 4 sub-categories)*	*13*
Total	**913**

The most common categories of exceptions observed were 'Arrears are Likely to Increase' (observed in 125 instances) and 'Accounts are likely to default after Modification' (observed in 111 cases). These indicate that the use of loss mitigation solutions across the 4 Group A Banks was viewed as a short term means of accommodating borrower distress, instead of a meaningful and sustainable restructuring of the loan terms.

Furthermore, the Banks often approved loss mitigation solutions that (i) were not within credit policy criteria (81 cases), (ii) overlooked verification of critical data when determining the viability of the modification, such as affordability and other debt assessment (observed in 83 cases) and (iii) did not take the borrower's performance across other accounts into consideration (in 95 cases). Additional exception categories observed include cases where modification activities were unsuccessful (97 cases) or the Banks had to offer subsequent modifications per loan (70 cases), or the borrower was unemployed (56 cases).

2.4. Residential Property Drive-bys

The general policy across the Banks with respect to the periodic updating of residential property values has been to update the original valuations on an annual basis through indexation to the PropIndex[18]. As such, the most recent collateral values provided by Banks were typically indexed valuations as of December 2012. In order to update the Bank valuations to 30 June 2013, BlackRock rolled these estimates forward based on movements in the quarterly BoG House Price Index. Furthermore, BlackRock commissioned local real estate brokers[19] to provide independent drive-by valuations for a sample of residential properties across the Group A Banks. The purpose of this drive-by exercise was three-fold:

- Data Validation: Independent third party estimates were used to determine whether the Banks' collateral valuations were reasonable, given the potential for error conducting valuations through indexation. Discrepancies can result from a number of sources, including but not limited to, the composition of the index compared to underlying Bank collateral and the length of time the index is used to roll forward prices
- Forced Sale Discounts: Drive-by valuations helped provide colour on potential forced sale discounts for liquidated properties by determining the sale prices likely to be realised within a limited marketing period
- Enhance Risk Assessment: Analysing the drive-by results enhanced BlackRock's understanding of collateralisation levels, and hence the risk levels associated with Group A Bank exposures

Process and Sample Selection

BlackRock selected a sample of loans from the Group A Bank loan tapes, and requested that the Banks submit addresses and other identification information, such as room count and property size for the underlying properties collateralising those exposures. In cases where properties were difficult to locate, Banks were asked to supply additional detail including photos, GPS coordinates, and miscellaneous descriptive information, where possible. The information was then utilised by a local valuation agent to locate each property and provide an estimated property sale value under three scenarios:

[18] Greek property price index

[19] Local real estate brokers were identified and coordinated by the firms, Clayton and Colliers International

i) Fair market value: If the property were to be liquidated in an orderly fashion and within a flexible timeframe, i.e., a realistic fair market value under the current environment; this valuation is referred to in the rest of this document as the 'drive-by valuation'

ii) 30 day quick-sale value: Quick sale liquidation value if the property were to be sold within 30 days

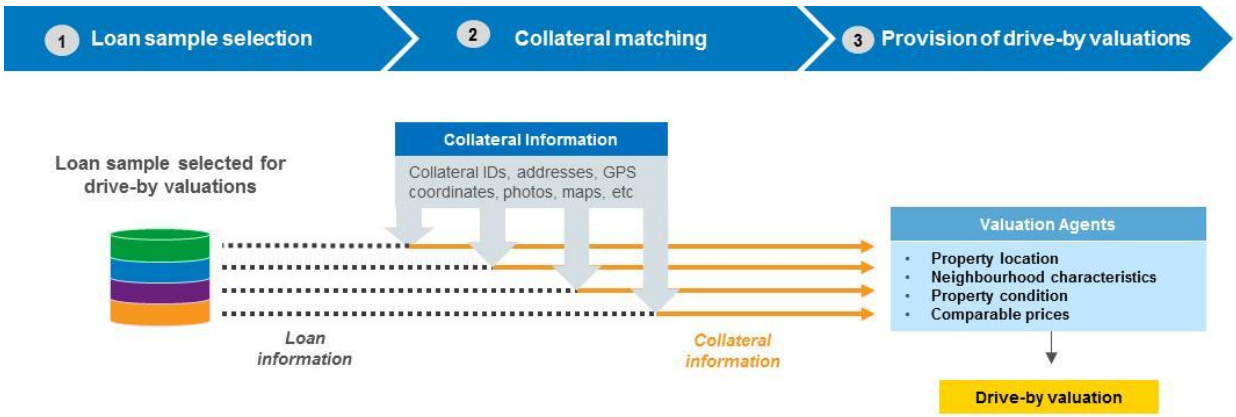
iii) 90 day quick-sale value: Quick sale liquidation value if the property were to be sold within 90 days

To inform this assessment, the agents reviewed the overall property condition, the general fundamentals of the neighborhood, and where possible, real-world bid and offer levels for comparable properties. In certain cases, the real estate agents also interviewed local residents to ascertain the prices at which they might be willing to buy or sell a particular property.

With the goal of obtaining 500 – 600 usable valuations, BlackRock selected a sample between 200 and 250 individual loans per Group A Bank (resulting in an aggregate count of 896 loans across all 4 Group A Banks) to account for anticipated challenges in locating certain properties within the relevant time constraints. Ultimately, there were 507 usable observations. While individual loan selection was generally random, construction of the sample was guided by two parameters. Firstly, loans had to have a minimum loan balance of EUR 50 K; and at least 50% of each Bank's sample had to be located within the Attica region.

During the drive-by valuation process, BlackRock maintained on-going communication with the valuation agent, overseeing the process and providing feedback and direction where necessary. As results were submitted over time, BlackRock performed analyses and quality control of the information received, with the goal of ensuring that the pool of successful observations maintained the intended representativeness of the original sample, such as location, size, and origination date.

Figure 21: Overview of Drive-by Valuation process



Summary of Drive-by Valuation Observations

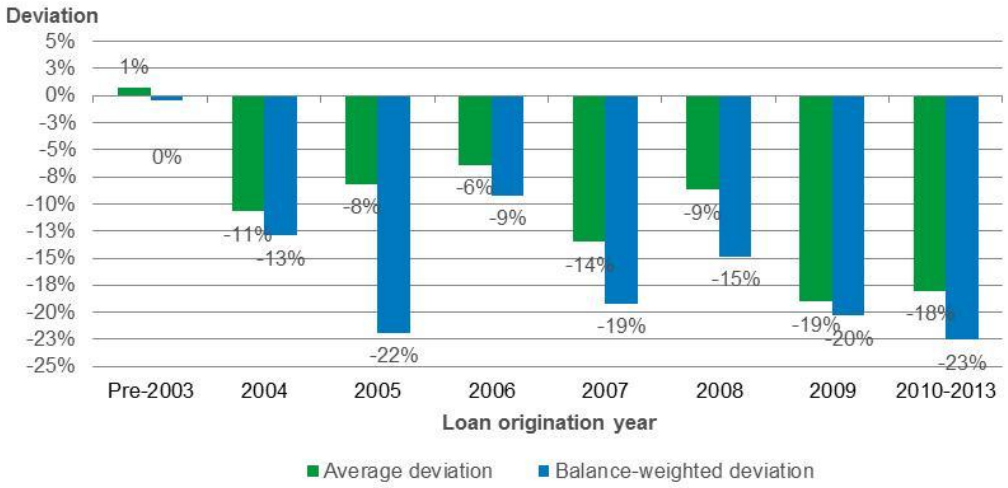
The final drive-by valuation sample amounted to 507 observations, spread relatively evenly across NBG (130), Eurobank (123), Alpha (130), and Piraeus (124). Observations from the analysis of the 507 property valuations conducted are listed below. These observations assisted BlackRock in determining appropriate collateral valuation adjustments

- Drive-by valuations were generally lower than the indexed property valuations: In aggregate, on a loan balance-weighted basis, the drive-by valuations were 16% lower than the Banks' indexed property valuations. This deviation is defined as the drive-by valuation minus the indexed valuation, expressed as a percentage of the indexed valuation
- Sellers are receptive to quick-sale transactions: During fieldwork, external valuation agents interacted with property owners and brokers interested in selling residential assets. Agents observed that sellers are receptive to large discounts versus the initial drive-by valuations in order to execute a speedy property sale. Sellers were receptive to discounts of 29% on average versus the drive-by valuation in

order to facilitate the execution of a sale within 90 days. Similarly, it was observed that they were willing to accept, on average a 43% discount if bid terms stipulated completion of the sale within 30 days. This observed behaviour could be attributed to the sellers' desire to avoid the potential arrival of new property taxes

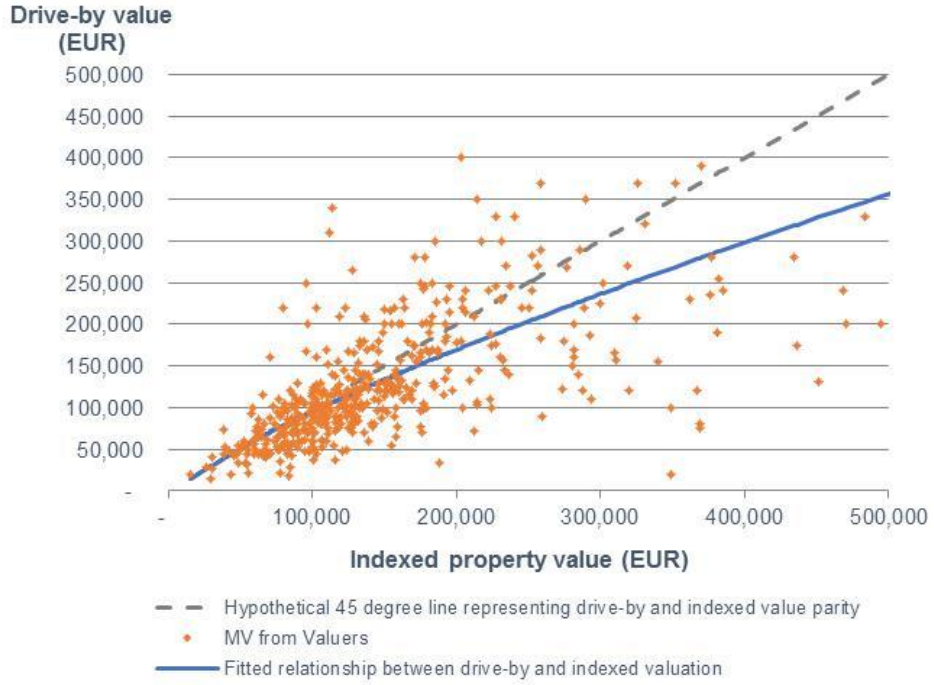
- Varied vintage effect: Beginning in 2008, there appears to be an upward trend in the magnitude of the deviation between drive-by and indexed valuations both in average and in loan balance-weighted terms, suggesting that the decline in realisable market values has outpaced that of the property index since 2008. Observations pre-2008 are somewhat less informative, due to the marked cyclicality of this deviation during those years

Figure 22: Deviations between drive-by and indexed valuations, by loan origination year



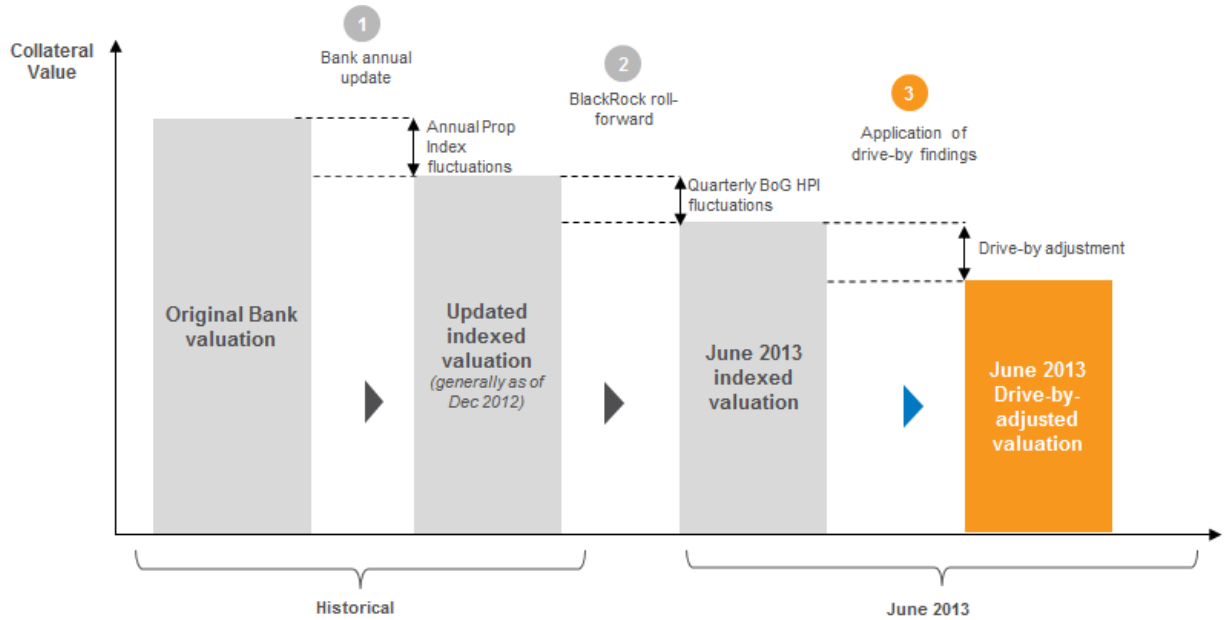
- Observed drive-by deviation is larger for higher indexed-value properties: For properties with relatively lower indexed values, the deviation between the drive-by valuation and indexed valuation was negligible; specifically for properties with indexed collateral valuations below EUR 70 K, there was no bias. Above this threshold, however, a bias gradually emerges, and expands as indexed valuations increase. The Figure below illustrates this dynamic relationship:

Figure 23: Relationship between Indexed Property Values and Fair Market Drive-by Values



Based on these findings, BlackRock applied a tailored drive-by adjustment to the entire universe of properties collateralising the Group A Bank Residential Mortgage portfolios. On average, the adjustment amounted to 13-14% of the updated indexed collateral value across all properties.

Figure 24: Illustrative application of drive-by findings in collateral valuation

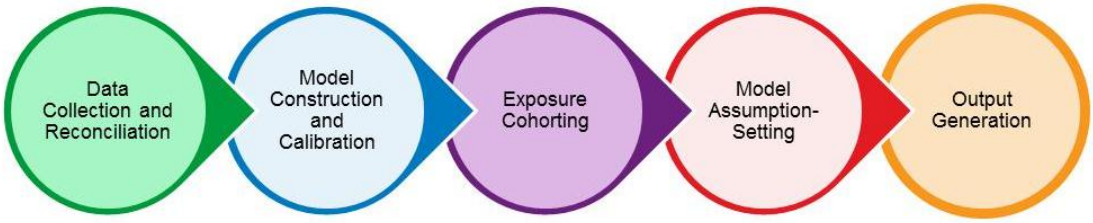


2.5. Modelling Methodology

2.5.1. General Approach

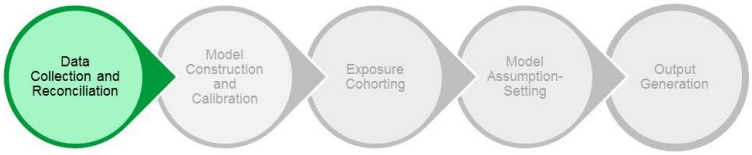
BlackRock utilised a bottom-up approach in generating credit loss projections. The process commenced with the collection of cross-sectional data for relevant exposures, stratification of these exposures, and analysis of historical loan performance to identify risk drivers and fundamental loan characteristics with predictive capabilities. BlackRock then constructed and calibrated the Residential Mortgage model based on these risk drivers, while incorporating assumptions generated from aforementioned observations to produce loss/recovery estimates. The various steps are illustrated below.

Figure 25: Residential Mortgages General Credit Loss Projections (CLP) Approach



Further detail on each step is outlined below:

Step 1 of 5: Data Collection and Reconciliation



The model leveraged a panel data set which is both cross-sectional and historical in nature.

Cross-sectional data: The Residential asset class encompasses all Residential Mortgage loans. Accordingly, BlackRock requested that the Banks identify, collect, and submit aggregated (and granular) statistics relating to these exposures (e.g., total balances, exposures size, geographic spread, vintage distribution, and collateral information.).

BlackRock also requested that Banks submit granular data via a standardised template containing fields with common key term definitions, to pre-empt inconsistencies resulting from the differing data frameworks and nomenclatures employed across the Banks. This cross sectional data, reflecting exposures as of the Reference Date, 30 June 2013, included:

- Borrower characteristics – Unique identifier[20], employment status, income, DTI, borrower city, etc.
- Loan characteristics – Balance, origination date, coupon structure, remaining term, LTV, etc.
- Performance – Current arrears status and recent history, arrears balance, loan modification history, etc.
- Collateral information – Collateral location, collateral type, origination appraisal, lien information, etc.

[20] For Banks that had recently acquired institutions (Alpha, NBG and Piraeus), BlackRock requested a unique identifier covering the Parent Bank and its acquired Banks

Historical data: BlackRock also analysed subsets of historical data to capture dynamic credit performance over time, including the following:

- Bank-specific delinquency data: 5 year historical time series showing the delinquency profile of Group A Banks' Residential Mortgage exposures at quarterly intervals. Due to various issues, data from certain Banks could not be used; FBB did not provide historical data; CPB did not provide historical data on denounced loans; Alpha only had yearly data (whereas the model required it on a quarterly basis); unintuitive data patterns precluded the use of submissions from Hellenic and Bank of Cyprus; and issues related to ATE good Bank data are detailed further in *Step 2 of 5: Model Construction and Calibration*
- Bank-specific loan payment history: Payment history for exposures which had been paid down fully over the 5 year historical time period ending 30 June 2013. For this, only data from Piraeus was used. Further detail on how this was incorporated into the model is included in *Step 2 of 5: Model Construction and Calibration*
- Historical market data: Historical time series of prepayment, and delinquency rates for 16 Greek ABS transactions for which performance data was available by extracting summary statistics on the transactions from Intex (and manually reviewing each deal's original offering documents. Such data provides a valuable supplement to the loan data provided by the Banks and facilitates additional out-of-sample regression analyses

BlackRock performed a verification of cross-sectional and historical data by comparing it against various other sources, such as supervisory reports provided by the Bank of Greece, Bank presentations, the Banks' various audited and unaudited financial statements, as well as data previously submitted for the 2011 Diagnostic. This was an iterative and interactive process between BlackRock and the Banks, whereby any errors in submissions, as well as potential inconsistencies therein were communicated to the Banks and subsequently addressed through clarifying communication and appropriate reconciliations where necessary.

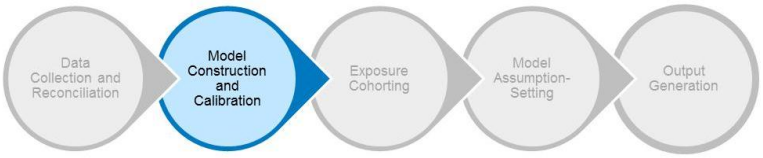
The multi-pronged coverage presented by both the cross-sectional data, as well as the various Bank-specific and selected historical time series, informed the subsequent model calibration process, allowing the model to better accommodate the dynamic and time-varying elements of various factors driving credit performance.

Loan Modifications (loss mitigation practices)

Banks have, on a relatively large scale, engaged in short- to medium-term loan modifications in order to accommodate current borrower financial difficulties. Notwithstanding any potentially adverse long term implications of these short-term modifications on loan sustainability and borrower financial condition, these modifications are typically accompanied by re-classifications of loan status from their respective states of delinquency to "Current". As a result, loan modification activity has the potential of distorting observations of true historical loan transitions, thereby obscuring the statistical relationship between exposure-specific/macroeconomic variables and fundamental loan performance. To preserve the statistical authenticity of the historical data set upon which the model was built, BlackRock removed from the analysis, all transitions occurring at or near observed modification dates.

The presence of modification, however, was identified during the statistical analysis and portfolio stratification phase as a key indicator of credit performance and roll rates between delinquency buckets. So while Modified transitions immediately around the time of modification were removed, inter-state transitions occurring at least one full quarter afterwards were incorporated into the historical transition matrix to enhance model effectiveness. The predictive capabilities of this factor introduced an additional layer of robustness into the model, while minimising the potential for fundamental loan performance mis-estimation due to what might have otherwise been a blanket incorporation of artificial modification-related transitions.

Step 2 of 5: Model Construction and Calibration



BlackRock developed the Greek Residential Mortgage model using a transition matrix framework (also known as the "Transition Matrix Model"), whereby the projected loss for any specific exposure is estimated by first taking into account the probability that the given exposure becomes delinquent, followed by default, and upon the point of liquidation, experiences a loss severity on the outstanding balance owed. Furthermore, the model computed this outstanding balance as a function of contractual amortisation through periodic instalments, as well as any potential prepayments.

For modelling purposes, active loans were classified into one of three initial states; "Current", "Delinquent", or "Default", which were determined by the initial arrears (DPD) status, standardised across the Banks as of the Reference Date. Additionally, loans may become "Liquidated" or "Prepaid", as per the table below:

Figure 26: Residential Mortgages - Model loan state definitions

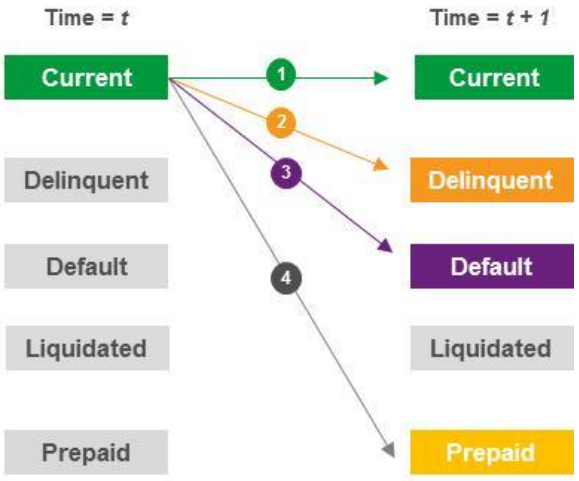
Loan State	BlackRock Model Definition
Current	0 – 89 DPD
Delinquent	90 – 359 DPD
Default[21]	360+ DPD
Liquidated	Occurs upon the sale of underlying collateral
Prepaid	Redemption of the outstanding loan balance ahead of the contractual schedule

NB: In addition to the loan states above, loans may pay down according to their contractual payment schedules, therefore becoming amortised in full

The likelihood of moving from one of these states to another is a function of several factors including, but not limited to, loan, borrower, and collateral characteristics. External factors, such as house prices, employment, interest rates and general economic activity also drive credit performance. For instance, the possible transitions which may occur to a loan in Current status at Time *t* are illustrated below.

[21] Includes loans in Legal or that have been denounced

Figure 27: Single-period transition possibilities for a Current loan in the Residential Mortgages model



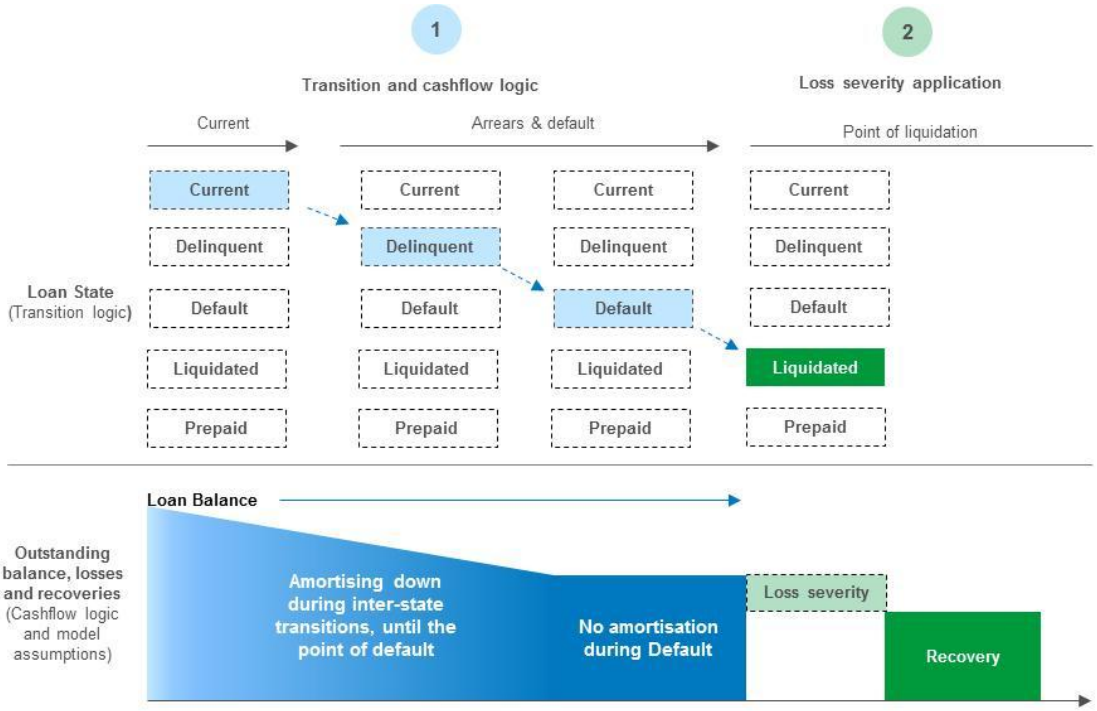
A loan which is Current at time *t* (i.e., between 0 and 89 DPD) may transition into one of the following states:

1	Stay Current, through payment of the necessary monthly instalment amounts, or;
2	Become Delinquent (defined as 90 to 360 DPD) due to missed payments, or;
3	Established borrower unwillingness or inability to continue satisfying loan terms may cause expedited transition into Default, or;
4	Become fully paid down ("prepaid"), in which case, the borrower has chosen to satisfy the total balance of the loan by paying all amounts owed

Additionally, between *t* and *t+1*, other exposures in the other loan states such as Delinquent and Default, may experience their own transitions, driven by exposure-specific factors and external variables

The quarterly transition matrices used to project the likelihood of loans moving between these states (as informed by the statistical relationships and risk drivers) were combined with a cashflow logic that employs periodic amortisation to determine outstanding loan balances at various points in time. The framework is illustrated in the Figure below.

Figure 28: Credit loss framework within the Residential Mortgage model



Note: Diagram above demonstrates a simplified 3-step transition for a Current loan at time *t*=0. Actual inter-state model transitions may be more complex

Quarterly transitions between loan states are assembled in a time-varying matrix like the one illustrated in the Figure below. Each row of the matrix must sum to one, and each element of the matrix not equal to 0 or 1 is a function of the loan-specific characteristics (both static and dynamic) and macroeconomic factors. For instance $P_{cd}(x_{it})$ is the probability that loan "i" with characteristics "x" at time "t" will transition from Current to Delinquent.

Figure 29: Transition Matrix Modelling

		Time = t+1				
		Current	Delinquent	Default	Prepaid	Liquidated
Time = t	Current	$P_{cc}(x_{it})$	$P_{cd}(x_{it})$	$P_{cf}(x_{it})$	$P_{cp}(x_{it})$	0
	Delinquent	$P_{dc}(x_{it})$	$P_{dd}(x_{it})$	$P_{df}(x_{it})$	0	0
	Default	$P_{fc}(x_{it})$	$P_{fd}(x_{it})$	$P_{ff}(x_{it})$	0	$P_{fl}(x_{it})$
	Prepaid	0	0	0	1	0
	Liquidated	0	0	0	0	1

A graph showing the transition probabilities calculated based upon historical transitions observed only for the NBG residential mortgage universe is included in the Appendix - Retail.

The identification of significant risk drivers influencing these transitions began with the previously detailed data stratification exercise in Section 2.2, where BlackRock performed multiple iterations of exposure classification and categorisation in order to risk isolate patterns that could potentially drive underlying credit performance (e.g., home prices, unemployment levels, LTV, EUR/CHF rates, interest rates, loan seasoning). Once identified, BlackRock tested these factors for statistical significance by performing a series of multinomial logistic regressions, and subsequently selected the combination of explanatory variables which optimised each model's overall predictive capability.

Missing Transitions

The dataset used for model estimation consisted of a panel dataset of loans that had an outstanding balance on 30 June 2013. Any loans that had been redeemed either by prepayment or scheduled amortisation during the preceding 5 year performance window were not in the dataset. These redeemed loans were most likely current in the quarters immediately prior to redemption. Therefore any estimate of the $P_{cc}(x_{it})$ transition is most likely downwardly biased. To correct this bias, a dataset from Piraeus consisting of all loans that redeemed, without a loss to the Bank, over the 5 year performance window was analysed. We used this dataset to approximate the missing number of transitions in the $P_{cc}(x_{it})$ cell of the matrix. Once this estimate was obtained, the intercepts in the logistic equations governing the first row of the matrix were adjusted to bring the $P_{cc}(x_{it})$ in line with its unbiased estimate. The same adjustment was then applied to all banks on the assumption that the bias was the same for all portfolios

ATE Good Bank

ATE Bank's data was excluded from the model estimation because its transitions are intrinsically biased. A large percentage of non-performing loans were removed from the balance sheet before the entity was acquired by Piraeus. If these transitions were included in the estimation, the $P_{cd}(x_{it})$ transition would most likely be downwardly biased i.e. have a reducing impact on projected PDs . Secondly, scoring ATE Good Bank through a model built on banks with good and bad assets would risk biasing its default and loss projections upwards. To correct for this potential bias, ATE Good Bank's historical data (available since the Piraeus acquisition date in July 2012 was passed through the model estimation (with a "missing transition" adjustment in place) and the actual $P_{cd}(\cdot)$ transition was compared to the predicted $P_{cd}(\cdot)$ transition. Subsequently, an ATE-specific intercept adjustment was made to correct for the observed error.

Below is a list of explanatory variables and relevant intercepts employed by BlackRock's Residential Mortgage model to predict quarterly Current to Delinquent transitions for non-Modified Residential Mortgage loans. This Figure below ranks the variables within the BlackRock Residential Mortgages transition matrix model in order of statistical significance. This indicates the level of confidence that the factor are a significant driver of performance and thus be included in the model. This does not indicate at all how important each of the factors

are for explaining variation either over time or between portfolios for the Credit Loss Projections.

For a full list of the suite of explanatory variables employed by BlackRock's Residential Mortgage model, please see Appendix – Retail, otherwise the current to delinquent explanatory variables is shown in the Figure below.

Figure 30: Residential Mortgage model explanatory variables and intercepts

Prob (Current->Delinquent) Non-Modified Loans	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Indexed LTV	1	+	25,709.7	1%
Loan Coupon	2	+	22,400.0	1%
Δ in Unemployment (Year on Year)	3	+	4,204.7	1%
ln(Loan Age+1)	4	+	1,365.3	1%
Loan Age	5	-	356.3	1%
Δ in Real GDP (Year on Year)	6	-	222.6	1%
Purchase Loan (0,1)	A	-	4,294.5	1%
Government Guaranteed Loan (0,1)	B	-	3,857.1	1%
Employment Status Categories	C	dependent on category	2,842.3	1%
Borrower Location Categories	D	dependent on category	1,116.6	1%
Other (non-govt) Guaranteed Loan (0,1)	E	-	219.7	1%
Flexible Loan (0,1)	F	-	100.2	1%
Interest Only Loan (0,1)	G	+	83.9	1%
CHF Denominated Loan (0,1)	H	+	40.8	1%
OEK Qualified Loan (0,1)	I	-	14.7	1%
Fixed Coupon (0,1)	J	-	8.3	1%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories

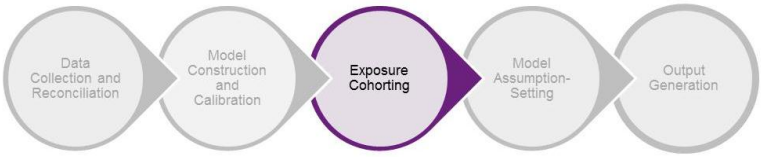
The most important variables in explaining the probability of default (PD) for the Residential Mortgages asset class are (a) the current status of the loan, (b) the modification status and, (c) the macroeconomic variables.

- Modification flags: Borrowers who have experienced a temporary or permanent reduction in their capacity to service their mortgage payments are commonly offered a modification to their loan terms by their lender. In order for these to be considered sustainable, the amended terms should represent an affordable solution for the borrower. Difficulties arise when Banks provide short-term solutions to borrowers with permanently diminished payment capacity, which results in high re-default rates.
  The modification flag has had a notable negative effect on performance, increasing the probability of rolling to more severe delinquency stages as well as decreasing the chance of curing from worse performing states
- Indexed LTV: Calculated at any point in time as the outstanding loan balance divided by the estimated market value of underlying collateral. BlackRock calculated future outstanding loan balances by applying the Residential Mortgage model's cashflow logic on 30 June 2013 balances. Future collateral values were derived by rolling the June 2013 Drive-by Adjusted Valuation forward based on a Bank of Greece Property Index curve, as provided by the Bank of Greece.
  When the outstanding loan balance exceeds the value of the property, a borrower has 'negative equity'. This can affect a borrower or a borrower's behaviour in a number of ways, including; a reduction of financial flexibility and ability to pay, a restriction of mobility reducing access to employment opportunities, a reduction in the willingness to pay and potentially a reduction in the propensity to maintain a property. Furthermore, LTV serves as a driver of loss severity upon liquidation; higher LTV exposures have less collateral protection against market price volatility and transaction expenses upon liquidation of underlying properties.
  Indexed LTV is the most significant dynamic variable for the model highlighted above
- Current loan coupon: The current coupon/interest rate (level) paid by a borrower on a mortgage. High interest rates generally reduce loan affordability, and increase the likelihood of a decline in borrower

credit performance. Additionally, the interest rate level at the time of origination may be considered a key credit risk indicator, as lenders typically charge higher interest rates to riskier borrowers at origination

- Unemployment: The change in unemployment is another relevant measure of current economic conditions, as it can result in a significant shock to a borrower's ability to pay, in turn affecting the performance of Residential Mortgages. As shown in the tables above, BlackRock observed a positive correlation between change in unemployment levels and transition probabilities into worse loan states
- Seasoning (or Loan age): Defined as the amount of the time that the loan has been outstanding. Seasoning tends to have a non-monotonic relationship with credit performance. At, and around the time of loan origination, borrower financial capacity, economic conditions, and loan terms (such as coupon, monthly instalment size, etc.) are all typically well-aligned, resulting in a low likelihood of quick deterioration in credit performance. Over time, the cumulative burden of periodic mortgage obligations, as well as changes in borrower financial capacity and economic conditions increases the likelihood that some loans age into delinquency, and default. Later in the loan life cycle, increased seasoning tends to drive down propensity to become delinquent and to default, as increased proximity to the ultimate goal of home ownership, and a willingness to utilise the significant time and resources spent in servicing their mortgages, motivates borrowers to continue making payments. The combination of these dynamics imply a hump-shaped seasoning-versus-delinquency/default curve
- ln(Loan Age +1) and Loan Age are the 4th and 5th most significant dynamic variables in the model highlighted above
- GDP: BlackRock found that the change in the level of economic activity as measured by Real GDP is a strong factor in explaining the performance of mortgages across all delinquency buckets. BlackRock used the year-on-year change in Real GDP to smooth seasonality effects. GDP growth has a positive effect on curing transitions and a negative effect on transitions to worse performing states
- Fixed-rate: The fixed-rate factor generally tends to reduce the likelihood of credit deterioration, as loan payments are known over time. This contrasts with the variability of floating-rate products, where unanticipated and potentially large increases in required loan instalments may prove unsustainable for the borrower. Lenders typically charge fixed interest rates to borrowers deemed as low risk, so to some extent, the fixed-rate interest rate type may be considered as an indicator of low credit risk

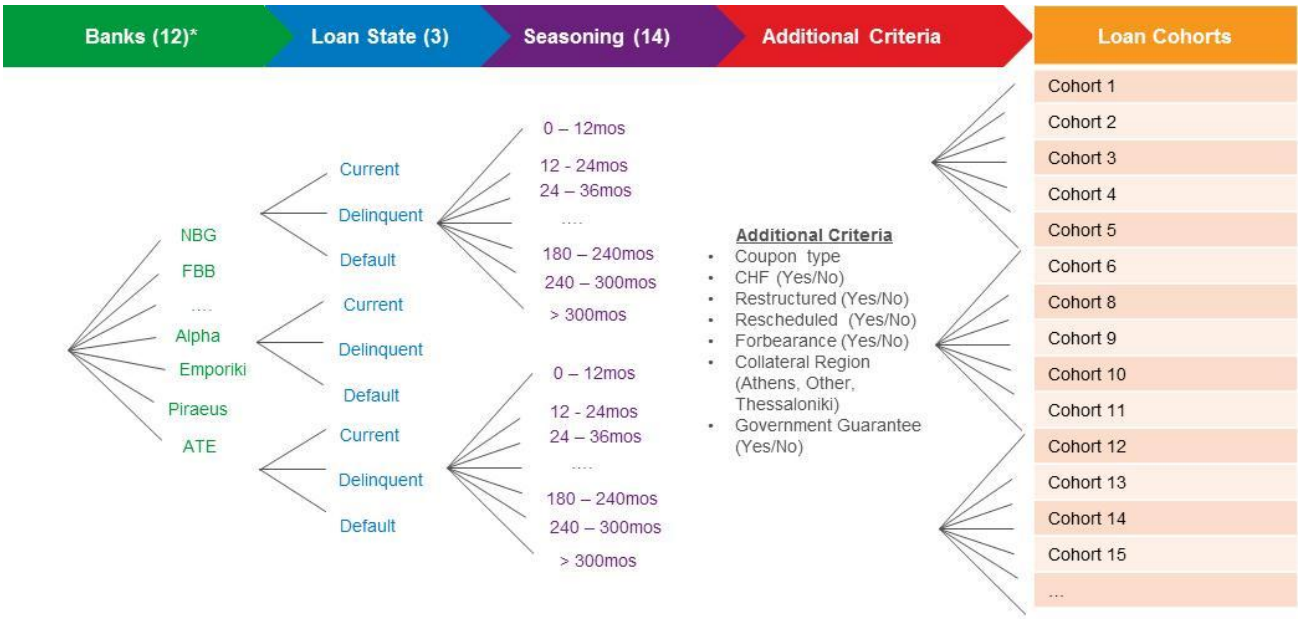
Step 3 of 5: Cohorting of Loan Data



To enhance the operational efficiency of the model, BlackRock placed each loan into a category (or "cohort") with other exposures that shared meaningfully similar attributes and characteristics. From a modelling perspective, each of these cohorts represents one line, which adopts the aggregated or average attributes of the individual loans it subsumes. For example, the total balance of a cohort is the sum of all loan balances within that cohort, while the corresponding LTV of that cohort becomes the balance-weighted average of its individual constituents.

Each of these cohorts was constructed based on attributes that mirror the explanatory variables in Figure 33. A snapshot of the cohorting logic used for this model is shown in the Figure below.

Figure 31: Cohorting waterfall: selected criteria

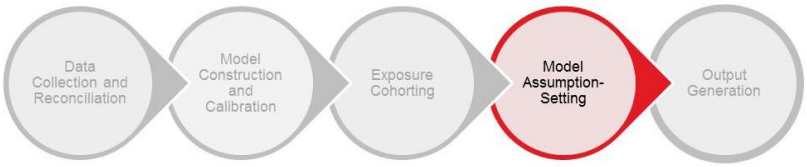


* Cohorts distinguish between different acquired entities associated with each Group A Bank

Cohorting is generally an iterative process, in which a set of criteria believed to have strong predictive relationships with loan performance (as informed by data stratifications and preliminary regression analyses) is selected, implemented, and tested until sufficient operational efficiency, subject to the constraint of preserving model accuracy through data granularity, is achieved. In this regard, the less granular the cohorts, the less operationally burdensome model execution becomes. However, cohorts should not be too "lumpy", as relevant (but relatively nuanced) exposure characteristics may not be incorporated due to the "averaging" process that cohort construction entails, thereby diminishing the explanatory contributions of these attributes and jeopardising output accuracy. Also, lumpy cohorts will generate convexity biases that may impact model accuracy in unexpected ways.

To get an aggregate view of losses for the entire portfolio, individual cohort results, as produced by the model were summed.

Step 4 of 5: Model Assumption-Setting



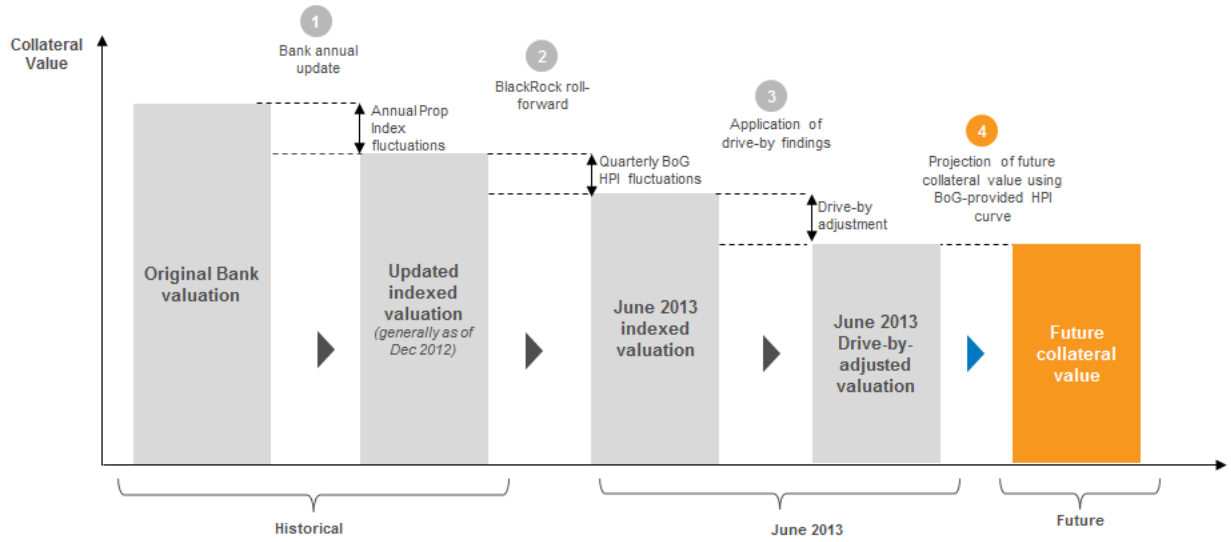
Key observations made by BlackRock regarding the Greek housing sector, institutional knowledge garnered through due diligence reviews and ongoing Bank correspondence, as well as specific market intelligence exercises such as the drive-by valuations facilitated the development and application of informed assumptions that were crucial to the final operation of the Residential Mortgage model. These assumptions related to loan behaviour, Bank practices, and projections regarding the macroeconomic variables.

Forward Looking Economic Assumptions

BlackRock utilised macroeconomic forecasts provided by the Bank of Greece for factors such as unemployment, housing prices, GDP, EUR/CHF exchange rates, and interest rates. The forward paths of these variables, as well as their relative trajectories across both Base and Adverse Cases, were key components to the CLP framework within the Residential Mortgage model. The forward curves incorporated into the model are shown in Section 1.4.

BlackRock applied the home price curve provided by the Bank of Greece to project collateral values of properties securing Group A Bank exposures at various points in time, as shown below.

Figure 32: Collateral valuation– application BoG-supplied HPI projections



Foreclosure and Liquidation Timeline

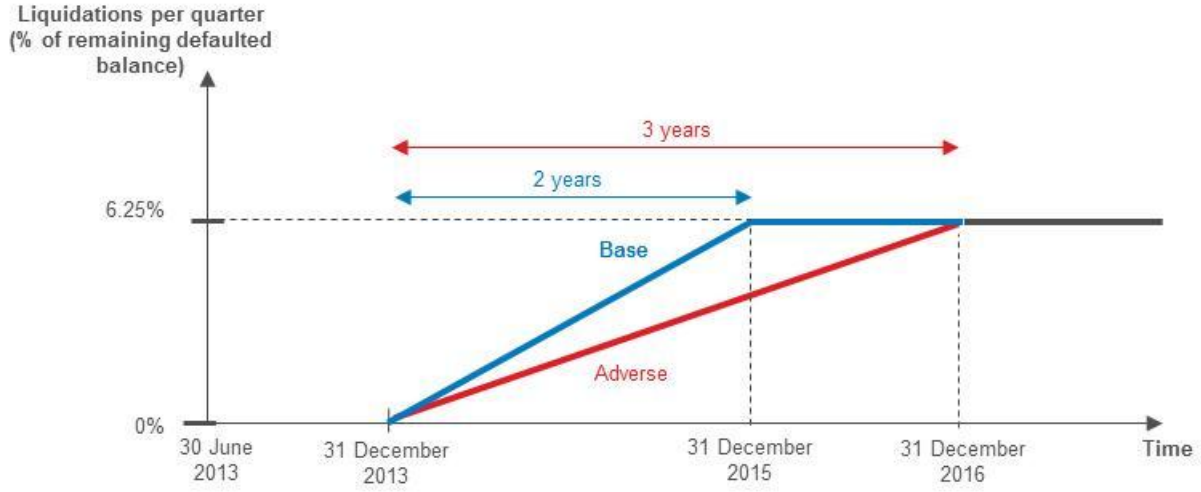
Key assumptions were made with respect to the realisation of residential mortgage losses and recoveries, with the goal of gaining additional clarity around the following:

- The length of time it would take to assume possession and subsequently sell the collateral, and
- Market discounts, transaction costs, and other outflows reducing the potential recoveries generated by the liquidation of underlying collateral

The time elapsed between the beginning of the foreclosure process and associated collateral liquidation plays a pivotal role in modelling. Liquidation timing is a key driver of recovery and loss estimates, due to the fact that other external variables, such as macroeconomic conditions, and house prices will collectively influence the potential proceeds that a lender may reasonably expect from a property sale. For example, prevailing market conditions and legal capacity at the time of an intended liquidation may become sufficiently unfavorable to necessitate postponement or cancellation of the auction.

BlackRock formulated a set of assumptions and procedures reflective of the Greek housing market, assumptions provided by the Bank of Greece, and the collections/recovery practices of the Greek banking institutions.

Figure 33: Liquidation Ramp-up Across Base and Adverse



There is currently an auction moratorium in place in Greece, which generally prohibits Banks from liquidating the properties of defaulted borrowers where (i) the loan amount is below EUR 200 K, and (ii) the property is a primary residence. Further details on this moratorium can be found in Section 1.4.

Based on an assumption provided to BlackRock by BoG, the discontinuation of this moratorium is modelled to take effect on 1 January 2014. It is important to note that this assumption is not reflective of any policy decision made on the matter, and is used solely for modelling purposes.

This assumption is reflective of the moratorium, lack of market demand, general Bank reluctance to foreclose and dispose of properties in the current environment, and potential capacity/procedural constraints at the responsible courts which may affect the actual rate of liquidation.

The actual amount of proceeds accruing to the lender following an auction is a function of various transaction costs and discounts on sale price, which are presented below.

Transaction Expenses

As previously articulated in Step 2 of 5: Model Construction and Calibration, the cashflow logic embedded within the Residential Mortgage model applies contractually stipulated amortisation, plus any potential prepayments to loan balances to quantify outstanding exposures at the time of liquidation, while collateral valuations are adjusted and subsequently rolled forward using drive-by valuation findings and Bank of Greece-supplied HPI projections. To determine loss (and recovery) estimates resulting from liquidation, it was necessary to apply additional adjustments taking into account transaction expenses incurred at the time of liquidation, sales taxes, legal costs, and any other miscellaneous outflows incurred by the seller. BlackRock assumed that, in aggregate, these expenses would amount to 11% of the property valuation. This assumption was formulated based on Greek legal counsel, feedback from the Greek Banks during the due diligence process, and general research on the Greek market.

Forced Sale Discount (adverse selection and auction format)

Aside from transaction expenses, the actual price at which the property sells (relative to the magnitude of the outstanding balance) will be the key determinant of recovery and loss. While collateral valuations and LTVs, as recorded by the model, include adjusted coverage ratios, as informed by the drive-by analysis, additional discounts were applied to collateral valuations. In addition to market volatility, poor liquidity and weak demand for Greek real estate assets, BlackRock observed data which indicated the need for further adjustment to arrive at loss severity upon liquidation.

- Adverse selection: Properties related to defaulted balances and borrowers tend to exhibit a greater propensity to fall into relatively poor conditions and become exposed to vandalism. BlackRock has

found that in the US and European experiences, the "distressed adjustment" due to this adverse selection has been relatively stable at 20%, implying that estimated property values are generally 20% below what an index value would suggest

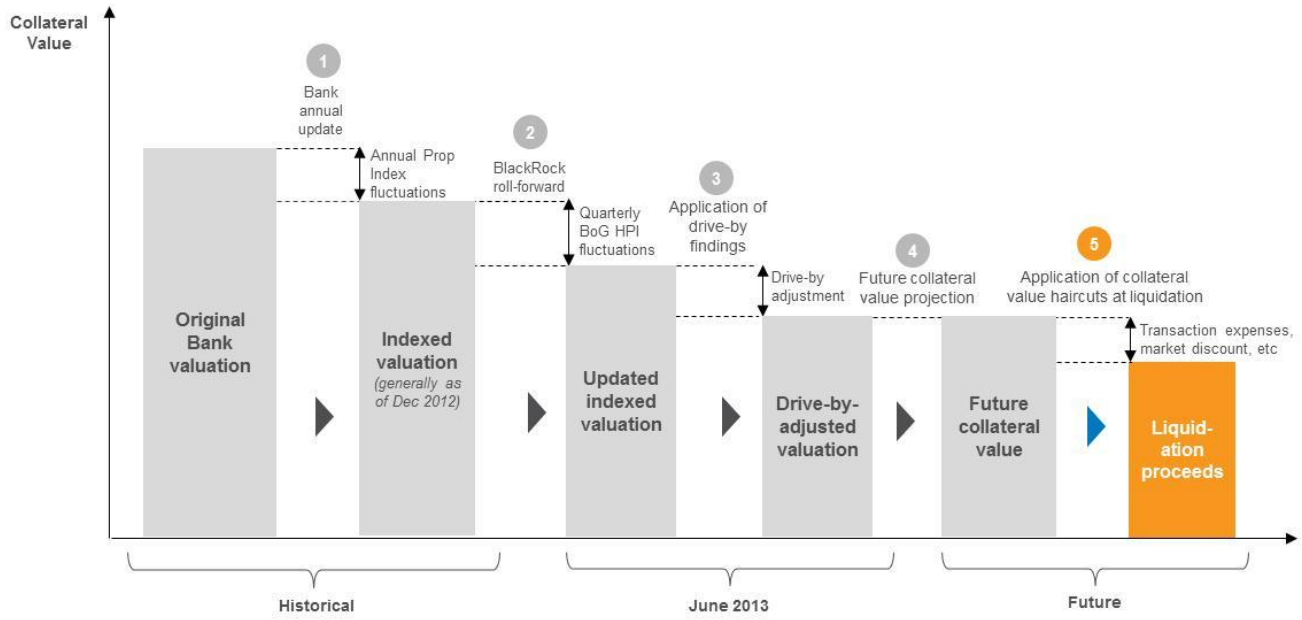
- Auction format: In Greece, residential properties are liquidated via the auction method, as mandated by law. All else being equal, sales through this disposition technique have typically led to greater discounts compared to sales brokered by real estate agents within an undefined period of time

For modelling purposes, BlackRock therefore assumed that the forced sale discount, applicable in the near- to medium-term to be 35% off the indexed, drive-by-adjusted property valuations. The model assumed that this discount will gradually decline to a steady state level of 20% over 5 years, assuming a similarly-timed normalisation of market conditions and practices over the same period.

Due to the ongoing auction moratorium in Greece, secondary market activity is relatively limited, with low demand, low availability of financing, and low supply. BlackRock calibrated the size and evolution of these assumptions through an analysis performed by real estate specialists (Colliers), external research on the Greek market, and discussions with Banks in relation to their experiences from the limited auctions which have been conducted in the recent past, as well as their expectations of achievable execution levels going forward. Colliers provided estimated market prices assuming a marketing period limited to 30-days, which BlackRock analogised to forced sale conditions. These were compared to the prices of the same properties, revalued through indexation, to determine the reasonableness of the forced-sale discount quoted above. This was further verified through the AQR due diligence Bank meetings citing Bank experience on their recent limited sales activity and third-party research on the Greek housing market. The 20% steady state forced-sale discount is typical of a functioning housing market, where there is reasonable supply and demand, and no significant unusual obstacles to foreclosure and sale, such as in the UK.

In the Adverse Case the forced sale discount is maintained at the same level. In a more stressed environment House Price Indices incorporate a higher proportion of forced sales/liquidations and therefore any additional adjustment for the higher level of stress is already embedded in the Index. The combination of the projected HPI in the Adverse Case and the Forced Sale Discount result in a reduction of projected liquidation proceeds compared to the Base Case.

Figure 34: Collateral valuation sequence – application of loss severity upon liquidation



The relative size of bars above, and directional nature of adjustments is meant only for ease of illustration

Loss Severity Calculation and the Tobit Transformation

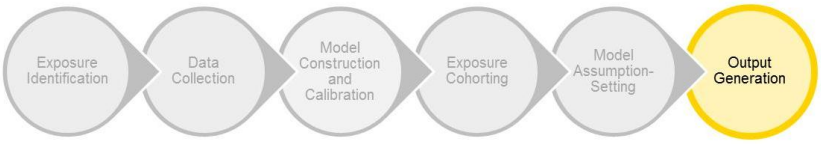
Loss severity is calculated by deducting auction proceeds (net of liquidation expenses) from the outstanding loan balance. This calculation therefore requires Indexed LTV at the time of liquidation as an input, as it is from this value that one derives the auction price.

However, Indexed LTV is a random variable, so in performing this calculation, the resulting Loss Severity is itself a random variable, which by definition cannot be less than zero. In statistical language, Loss Severity is "censored" at zero, because in all cases where a gain upon liquidation would occur, a zero loss is recorded. Calculating the expected value of a censored random variable like Loss Severity requires the application of a Tobit Transformation, which is detailed in the Appendix.

Other key model assumptions:

- Exposure at default: BlackRock considered only the funded balance of Residential Mortgages as very few loans featured drawable amounts (construction loans) or revolving features.
- Delinquent loan pay rate: the percentage of the due installment that is paid for delinquent Residential Mortgages is assumed to be 40%. This was determined from the historical data provided by the Banks and is consistent with assumptions in other jurisdictions
- Defaulted loan pay rate: Defaulted loans were assumed to pay no interest or principal.
- Prepayment: A prepayment model was derived from Greek Residential Mortgage securitisation data
- Government-guaranteed loans: for government-guaranteed loans, losses were assumed to be zero

Step 5 of 5: Output Generation



Each cohort was individually run through the model, using the aggregate and weighted-average characteristics of its constituents to determine projections for prepayment, default, delinquency, and loss severity. Model results were aggregated across these cohorts and summed to determine overall portfolio performance. For this analysis, BlackRock focused on the following time horizons: 1-year, 2-year, 3-year, and lifetime. Model outputs were also compared across the Banks to confirm that results reflect BlackRock's due diligence findings (e.g., Banks with more conservative underwriting and/or more assertive and organised collection efforts should incur lower losses).

Losses (projected to occur at the point of liquidation) were reported "at the Time of Default". For any given period, Loss at the Time of Default is the sum of all future losses associated with any balances that transition to 90+ DPD during that period. This calculation is provided for time zero (i.e., for loans that were 90+ DPD as of the Reference Date), years 1, 2, and 3 (i.e., for balances that transition into 90+ DPD at any point within 1, 2, and 3 years, respectively), and lifetime (for balances that transition into 90+ DPD at any point into the future).

Model Test Statistics: Rank-Ordering Capability

To provide a sense of the Goodness-of-Fit for the model components created by the logistic regression, Concordance Indices for various subsamples are provided below. This statistic measures the rank-ordering capability of probabilistic choice models. For Residential Mortgages, the full sample refers to the model fit that was tested on the full 5-year dataset. The in-sample model was fit on the dataset through the end of 2012 (i.e. the last two transitions were held out). This model was then tested on this in-sample dataset, and out-of--

sample on the last two transitions. Overall, the component models perform well out-of-sample, in that there is only a modest deterioration in rank-ordering capability. The one example that illustrates a large drop can be explained by the fact that there is little variation in the out-of-sample dataset for this model to "test".

Figure 35: Residential Mortgages In- and out-of-Sample Test Results

Asset Class	Transition(s)	Sample[1]	Concordance Index[2]
Residential Mortgages	Prob(Current->Delinquent or Default)	Full Sample	72.6%
Residential Mortgages	Prob(Current->Delinquent or Default)	In-Sample	72.4%
Residential Mortgages	Prob(Current->Delinquent or Default)	Out-of-Sample	72.3%
Residential Mortgages	Prob(Delinquent->Current)	Full Sample	77.9%
Residential Mortgages	Prob(Delinquent->Current)	In-Sample	78.8%
Residential Mortgages	Prob(Delinquent->Current)	Out-of-Sample	66.0%
Residential Mortgages	Prob(Delinquent->Default)	Full Sample	66.6%
Residential Mortgages	Prob(Delinquent->Default)	In-Sample	68.1%
Residential Mortgages	Prob(Delinquent->Default)	Out-of-Sample	61.8%
Residential Mortgages	Prob(Default->Current or Delinquent)	Full Sample	83.8%
Residential Mortgages	Prob(Default->Current or Delinquent)	In-Sample	84.3%
Residential Mortgages	Prob(Default->Current or Delinquent)	Out-of-Sample	60.5%[3]

1. For Residential Mortgages, the last two transitions were set aside for out-of-sample testing.
The "Full" Sample refers to the complete dataset, and the model that was used for computing the CLPs.

2. The Concordance Index is obtained from: C = (nc + 0.5*(t - nc - nd))/t, where nc = # of pairs concordant, nd = # of pairs discordant, and t = # of pairs with different responses.
The popularly known Gini Coefficient (or Somers' D) is simply 2*C-1.

3. This rank-ordering statistic is depressed by a large number of "ties" in the out-of-sample dataset. The ties arise from the fact that this component of the transition matrix is
driven largely by macroeconomic factors, for which there is little variation on the out-of-sample dataset.

2.6. Group B Banks

2.6.1. Portfolio Stratifications

Leveraging the same standardised line-level templates used for the Group A Banks, BlackRock requested cross-sectional loan and collateral information as of the Reference Date from the Group B Banks. Of the 7 Group B Banks, 5 reported holding residential loan exposures: Attica, Panellinia, Probank, Proton and TT.

BlackRock produced summary stratification tables of the dataset and reviewed the key portfolio characteristics and risk drivers. Due to time constraints, these reports were not separately shared with the Group B Banks. However, each of the Group B Banks was asked to submit basic balance reconciliation data, including summary tables containing key data fields such as Current Funded Balance and percentage of Non-Performing Loans, to aid BlackRock in checking the general accuracy of data file being analysed.

Where necessary, BlackRock communicated with each Bank to seek clarification regarding specific inconsistencies or other issues identified by BlackRock. These concerns were addressed by the Banks to the extent practical in given the compressed time frame during which this analysis was conducted.

A stratification of all Residential Mortgage exposures across the full spectrum of Group B Banks is shown below.

Figure 36: Residential Loan Stratifications

		Attica Bank	Panellinia	Probank	Proton (Good Bank)	TT Hellenic Postbank	Group B Total	Group B Avg.
Portfolio Exposure	Funded (EUR MM)	560	72	236	27	5,063	5,959	
Performance Status	Current (0-89 DPD, %)	70.8	71.4	92.7	95.7	85.7		84.4
	Delinquent (90-359 DPD, %)	11.3	11.6	5.2	4.1	9.7		9.6
	Defaulted (360+ DPD, Denounced, %)	17.8	17.0	2.1	0.2	4.7		5.9
	Adjusted 90+ DPD[1] (%)	29.4	45.6	34.9	8.7	21.6		23.1
Loss Mitigation	Total Loss Mitigation	11.9	21.7	27.8	4.6	9.1		10.2
	Modified, Current (0-89 DPD, %)	0.3	17.1	27.6	4.4	7.3		7.5
	Modified, Delinquent (90+ DPD, Denounced %)	11.6	4.6	0.2	0.3	1.8		2.7
Loan Characteristics	Number of Borrowers (K)	5.7	0.8	2.7	0.3	95.0	104.5	
	Number of Loans (K)	7.2	0.8	3.7	0.5	130.9	143.2	
	Average Loan Size (EUR K)	77.8	87.1	64.0	49.6	38.7		41.6
	WA Coupon (%)	2.9	3.9	3.8	3.0	2.9		3.0
	WA Seasoning Term (Months)[2]	74.4	28.6	49.1	41.8	82.4		79.5
	WA Indexed LTV (%)	81.5	85.9	65.4	67.7	69.4		70.5
	WA Adjusted Indexed LTV[3] (%)	90.0	101.7	74.9	77.3	76.8		78.3
	CHF (%)	0.0	5.7	1.0	0.0	0.0		0.1
	Government Guaranteed (%)	0.0	0.0	0.4	0.0	0.8		0.7

1. Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been modified

2. Seasoning term is defined as months since modification date for modified loans and months since origination for non-modified loans

3. LTV implied by property valuations indexed to June 30, 2013, and subsequently adjusted as informed by the drive-by valuation results

2.6.2. Methodology Overview

The modelling methodology for the Group B Banks was broadly similar to the approach used for the Group A Banks. As described above, BlackRock collected loan-level and collateral-level information from each of the Banks. The dataset was then organised into risk-based cohorts and run through the same transition models as used for the Group A Banks to estimate CLPs.

The primary difference from the method used for the Group A was that BlackRock did not request a historical performance dataset from the Group B Banks. Therefore none of the models were estimated using Group B Bank data. Instead, the Group B loans were analysed using a model estimated based on Group A Bank historical information.

Consumer Loans

3.1. Scope of Asset Quality Review

As of 30 June 2013, Consumer loans totalled EUR 23.8 BN across Group A Banks and EUR 1.8 BN across Group B Banks. The purpose of the Asset Quality Review (AQR) was to provide an assessment of the assets held by each Bank and to gather qualitative information regarding Banks' lending practices, portfolio monitoring, and workout. BlackRock assessed Consumer loan asset quality through the following processes:

- Conducted management due diligence sessions to review and discuss Bank history, product types, origination strategy, portfolio performance, loss mitigation practices, and collateral valuation and recovery efforts
- Reviewed loan-level data for Group A Bank and Group B Banks as of 30 June 2013. For Group A Banks, BlackRock also conducted an in-depth analysis of 5-year historical performance data, which was used to model probabilities of defaults
- Directed an independent review covering a sample of Group A Consumer Loan files. The goal of the exercise, which was performed by Clayton and reviewed by BlackRock, was to assess the credit files and evaluate origination practices and refinancing/restructuring practices. A total of 239 Consumer Loan files were reviewed consisting of 160 loan files selected from Group A Parents Bank portfolios and 79 loan files from entities that were recently acquired by the Group A Banks. This also includes the 80 Consumer Loan file reviews performed as part of the TAR exercise
- Conducted research and consulted external sources to inform model projections and calibrate models, where necessary. For example, BlackRock referenced recovery data observed from auto, credit card and other consumer lending in other jurisdictions

These qualitative and quantitative factors served as inputs to inform BlackRock probability of default and loss given default models developed to generate CLP results.

The due diligence process for Group A Banks included an original request for information (RFI) sent to each Bank prior to management due diligence sessions, loan-level data requests, and follow-up RFIs if necessary. The Consumer Loan RFI covered the following main areas:

- Lender profile and organisational history
- General product features and portfolio stratifications
- Origination and underwriting strategies
- Credit review and monitoring processes
- Loan payment collection and servicing operations
- Loss mitigation strategies
- Historical defaults
- Credit performance projections
- Collateral valuation and recovery practices (including valuation of personal guarantees)
- Loan ratings models
- Status of any merger integrations, including the effects on banking practices and data systems

Full-day due diligence sessions were held with management at each Group A Bank to cover all Residential Mortgage and Consumer Loans, while one-day due diligence sessions were held to discuss both Retail and Commercial asset classes for the Group B Banks. In addition to the above listed RFI topics covered during management presentations, BlackRock also requested the following specific documentation be submitted by each Group A and Group B Bank:

- Detailed loan-level data submission
- Product type descriptions
- Detailed summaries of the Consumer Loan portfolio by various risk metrics
- Schedule of historical payment status
- Loan underwriting and credit approval documentation
- Bank organisational structure for Consumer Loan underwriting, loan servicing, and payment collection department
- Description of specialised Consumer Loan products

If any information was unclear or incomplete from the due diligence sessions or data submissions, BlackRock submitted written follow-up RFIs, exchanged emails with relevant Bank employees, and held follow-up calls, where necessary.

3.2. Portfolio Stratifications and Risk Analysis

Data Collection and Review

BlackRock developed a standardised loan-level data template tailored to Greek consumer products, which included over 110 data fields covering, but not limited to, the following areas:

- Borrower characteristics – Unique identifier, employment, income, DTI, borrower city, etc.
- Loan characteristics – Facility type, funded balance, unfunded balance, total limit, origination date, coupon structure, remaining term, etc.
- Current and historical performance – Current and historical arrears status, arrears balance, current and historical loan modification status, etc.
- Collateral information – Collateral type, origination appraisal, etc.

Upon receipt of the Banks' submissions, BlackRock downloaded and on-boarded the datasets to a database system, which facilitated the organisation and harmonisation of data across various output formats (e.g., .txt, .xls), the creation of portfolio stratifications and data gap reports, and the implementation of data overrides and assumptions. The original data submissions by the Banks varied in the level of completeness, and over the course of several weeks, BlackRock and the Banks engaged in a comprehensive data reconciliation process.

BlackRock produced detailed stratification tables in a standard format and compared these tables to summary tables provided by each of the Banks to enable further corroboration of balances and other key risk factors. This process allowed the Banks to acknowledge that the data supplied to BlackRock was consistent with the Banks' own understanding of their respective portfolios. Inconsistencies were addressed via iterative data re-submissions, email correspondence, teleconferences, as well as in-person meetings. Reconciliations of differences were performed subject to materiality and to the extent practical, within the limited timeframe during which the analysis was conducted.

Data Assumptions

Following the data reconciliation process, some data deficiencies remained, the extent of which varied across Banks. Incomplete or inconsistent data necessitated, for modelling purposes, the application of practical working assumptions in order to complete the dataset. These working assumptions were informed by observations from the overall dataset, qualitative knowledge extracted from the AQR due diligence sessions, as well as BlackRock's judgment based on Greek-specific experience.

Figure 37: Data Gap Assumptions and Related Calculations

Missing Field	Data Assumptions
Origination date	Assumed Bank's WA Seasoning Term
Postal code	Assigned to Geographic Location "Other" category
End date for loans Still in Forbearance	Assigned to Bank's WA Forbearance End Date
End date for loans Still in IO	Assigned loan maturity date as IO end date
Maturity date	Assigned maturity date based on time since origination date and loan remaining term
Modification flag missing	Assumed loan was not Modified
Modification date	Assumed Bank's WA Seasoning Term for Modified loans
Current interest rate	Assigned Bank's WA interest rate by product type
Interest rate type	Assigned to Floating
Employment type	Categorised into high-level categories by BlackRock
Geographic location (based on Postal Code)	Assigned based on combination of available data in collateral and borrower data files (Athens, Thessaloniki, Other)

In addition to assumptions made to produce a more complete dataset, BlackRock also developed new fields through adjusting and supplementing Bank-provided data. These additional fields expanded the list of portfolio characteristics available to BlackRock for further analysis, and include the following.

Calculated Fields	Calculation
Seasoning term	• For loans that have not been Modified, difference between origination date and 30 June 2013, measured in months • For Modified loans, the difference between modification date and 30 June 2013, measured in months
Remaining term	• Number of months between Maturity Date and 30 June 2013, or; • Subtracted number of months since loan origination from loan term

Data Mapping and Standardisation

Despite universal field definitions, the degree of format variability for certain Bank responses within key fields necessitated the standardisation of those fields' contents in accordance with a BlackRock-developed mapping framework (NB: relative to other assets classes, data format variability tends to be particularly high for Retail). This step was performed with consideration for the need to preserve data granularity.

Fields for which data mapping was required included Coupon Type and Delinquency Status. In these cases, BlackRock constructed a more concise range of labels/field contents, and based upon the original Bank responses, assigned existing line items to the labels within the smaller subset.

Portfolio Overview and Summary Statistics

The Group A Bank Consumer Loan universe encompassed EUR 23.8 BN of funded exposure across more than 5.6 MM loans. Eurobank and Piraeus have the largest share of Consumer Loan exposures, with EUR 6.9 BN and EUR 6.1 BN in total funded balances respectively. NBG follows closely with EUR 5.9 BN of funded

balance (25% of the total), and Alpha is the smallest constituent, with a EUR 5.0 BN funded balance, representing 21% of the universe.

Figure 38: Group A Banks Consumer Loan Universe

	Balance		Loan Count		Borrower Count	
	Loan Balance (EUR MM)	% of Total Balance	Loan Count	% of Total Count	Borrower Count	% of Total Count
Alpha	4,971	20.9%	1,108,411	19.6%	762,821	19.1%
Eurobank	6,912	29.0%	1,481,314	26.2%	1,021,864	25.6%
NBG	5,860	24.6%	1,719,372	30.5%	1,129,234	28.3%
Piraeus	6,085	25.5%	1,335,457	23.7%	1,079,013	27.0%
Total	**23,828**	**100.0%**	**5,644,554**	**100.0%**	**3,992,932**	**100.0%**

The table in Figure 39 below contains an overview of key characteristics and risk metrics of Consumer Loan exposures across the entire Group A Bank universe, side-by-side and relative to the Group A Bank average. It features key risk metrics such as % Loss Mitigation (capturing the various modification tools employed by the Banks), % Current, Delinquent, or Defaulted (segmenting the portfolio into delinquency levels), and % Secured which provides a comparative overview of the relative risk compositions across the spectrum of Banks.

Figure 39: Overview of Group A Bank Consumer Loan Portfolios

		Alpha	Eurobank	NBG	Piraeus	Group A Total	Group A Avg.
Portfolio Exposure	Funded (EUR MM)	4,971	6,912	5,860	6,085	23,828	
Performance Status	Current (0-89 DPD, %)	58.5	57.9	50.7	51.5		54.6
	Delinquent (90-179 DPD, %)	1.7	2.0	4.2	3.6		2.9
	Defaulted (180+ DPD, Denounced, %)	39.7	40.2	45.0	44.8		42.5
	180+ DPD (%)	*28.0*	*11.5*	*1.2*	*6.3*		*11.1*
	Denounced (%)	*11.8*	*28.6*	*43.9*	*38.5*		*31.4*
	Adjusted 90+ DPD[1] (%)	51.8	60.4	62.3	60.8		59.2
Loss Mitigation	Total Loss Mitigation	10.9	27.1	24.5	23.6		22.2
	Modified, Current (0-89 DPD, %)	*10.3*	*18.2*	*13.1*	*12.4*		*13.8*
	Modified, Delinquent (90+ DPD, Denounced %)	*0.5*	*8.9*	*11.4*	*11.3*		*8.4*
Security	Secured by Tangible Collateral (%)	12.4	37.1	11.4	26.0		22.8
Loan Characteristics	Number of Borrowers (K)	762.8	1,021.9	1,129.2	1,079.0	3,992.9	
	Number of Loans (K)	1,108.4	1,481.3	1,719.4	1,335.5	5,644.6	
	Average Loan Size (EUR K)	4.4	4.7	3.4	4.6		4.2
	WA Coupon (%)	11.6	11.0	11.6	11.6		11.4
	WA Seasoning Term (Months)[2]	59.3	51.8	69.4	53.4		58.1

1. Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been modified

2. Seasoning term is defined as months since modification date for modified loans and months since origination for non-modified loans

- The aggregate percentage of 90+ DPD and denounced loans by balance across all Group A Banks was 45.4%, while loss mitigation was performed on 22.2% of the total universe
- 22.8% of loans by balance are secured by tangible collateral, ranging from 11.4% for NBG loans to 37.1% for Eurobank loans. The weighted average seasoning term of the Group A Bank universe is 58 months
- 59.2% of loans were classified as Other Consumer Loans, 36.6% as Revolving Loans, and 4.1% as Auto Loans. 22.3% of loans are closed accounts where the borrower can no longer draw on the account

BlackRock utilised data stratifications analysis to facilitate the identification of key patterns and credit risk drivers within the portfolio. Observed risk drivers and patterns were analysed and reviewed in detail alongside the findings from other AQR due diligence processes. Below is a brief walkthrough demonstrating how the iterative stratification highlights the significance of one particular metric (in this case, Secured by Tangible

Collateral) in relation to credit performance. The following two tables in the Figure below show a side-by-side comparison of loan characteristics and risk metrics of the Consumer Loan universe by loans secured by tangible collateral and unsecured exposures.

Figure 40: Consumer Loan Stratifications

1 The table below shows stratifications of loans secured by tangible collateral

		Alpha	Eurobank	NBG	Piraeus	Group A Total	Group A Avg.
Portfolio Exposure	Funded (EUR MM)	617	2,561	670	1,584	5,432	
Performance Status	Current (0-89 DPD, %)	42.3	70.3	74.3	62.7		65.4
	Delinquent (90-179 DPD, %)	1.3	3.3	4.3	4.1		3.4
	Defaulted (180+ DPD, Denounced, %)	56.4	26.4	21.3	33.2		31.2
	180+ DPD (%)	*19.1*	*10.4*	*0.4*	*5.1*		*12.9*
	Denounced (%)	*37.3*	*16.0*	*20.9*	*28.1*		*18.3*
	Adjusted 90+ DPD[1] (%)	71.3	64.0	57.1	53.5		60.9
Loss Mitigation	Total Loss Mitigation	14.0	43.4	41.4	22.7		33.8
	Modified, Current (0-89 DPD, %)	*13.6*	*34.2*	*31.4*	*16.2*		*26.3*
	Modified, Delinquent (90+ DPD, Denounced %)	*0.4*	*9.2*	*10.0*	*6.4*		*7.5*
Security	Secured by Tangible Collateral (%)	100.0	100.0	100.0	100.0		100.0
Loan Characteristics	Number of Borrowers (K)	37.0	135.3	62.7	143.0	377.9	
	Number of Loans (K)	50.6	148.5	68.9	170.3	438.4	
	Average Loan Size (EUR K)	12.2	17.2	9.7	9.3		12.4
	WA Coupon (%)	9.3	7.0	6.5	9.0		7.8
	WA Seasoning Term (Months)[2]	39.5	26.4	31.4	40.2		32.5

1. Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been modified

2. Seasoning term is defined as months since modification date for modified loans and months since origination for non-modified loans

2 The table below shows stratifications of loans that are not secured by tangible collateral

		Alpha	Eurobank	NBG	Piraeus	Group A Total	Group A Avg.
Portfolio Exposure	Funded (EUR MM)	4,355	4,351	5,189	4,502	18,396	
Performance Status	Current (0-89 DPD, %)	60.8	50.6	47.7	47.6		51.5
	Delinquent (90-179 DPD, %)	1.8	1.2	4.2	3.5		2.7
	Defaulted (180+ DPD, Denounced, %)	37.4	48.3	48.1	48.9		45.8
	180+ DPD (%)	*29.2*	*12.2*	*1.3*	*6.8*		*13.7*
	Denounced (%)	*8.1*	*36.1*	*46.8*	*42.1*		*32.1*
	Adjusted 90+ DPD[1] (%)	49.0	58.2	63.0	63.4		58.7
Loss Mitigation	Total Loss Mitigation	10.4	17.5	22.3	24.0		18.8
	Modified, Current (0-89 DPD, %)	*9.9*	*8.8*	*10.7*	*11.0*		*10.1*
	Modified, Delinquent (90+ DPD, Denounced %	*0.6*	*8.7*	*11.6*	*12.9*		*8.6*
Security	Secured by Tangible Collateral (%)	0.0	0.0	0.0	0.0		0.0
Loan Characteristics	Number of Borrowers (K)	725.8	886.6	1,066.5	936.1	3,615.0	
	Number of Loans (K)	1,057.8	1,332.8	1,650.4	1,165.1	5,206.2	
	Average Loan Size (EUR K)	4.0	3.3	3.1	3.9		3.5
	WA Coupon (%)	11.9	13.3	12.2	12.5		12.5
	WA Seasoning Term (Months)[2]	62.2	66.7	74.3	58.1		65.7

1. Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been modified

2. Seasoning term is defined as months since modification date for modified loans and months since origination for non-modified loans

From the above stratifications, the following observations can be made:

- Loans secured by tangible collateral were generally less likely to be 90+ DPD (34.6%) compared to loans not secured by tangible collateral (48.5%)
- Loans secured by tangible collateral generally had lower weighted average coupons (7.8%) compared to unsecured loans (12.5%)

3.2.1. Auto Loans

In addition to the review process described above, stratification tables were used by BlackRock to identify sources and drivers of risk in the Auto Loan portfolios and explain these in a simplified manner.

A summary Group A Bank Auto Loan portfolio stratification table is shown below. The stratification table provides a summary of each Bank's funded balance, average loan size; weighted average portfolio coupon; weighted average seasoning term; percentage of loans secured by tangible collateral; percentage of loans that have undergone Loss Mitigation; percentage of loans that are 90+ DPD; and percentage of loans that are "Adjusted 90+ DPD" (which covers 90+ DPD loans and loans which are Current and have been Modified).

Figure 41: Overview of Group A Bank Auto Loan Portfolios

		Alpha	Eurobank	NBG	Piraeus	Group A Total	Group A Avg.
Portfolio Exposure	Funded (EUR MM)	181	290	305	211	987	
Performance Status	Current (0-89 DPD, %)	75.4	78.9	70.7	52.3		70.0
	Delinquent (90-179 DPD, %)	0.9	0.8	3.4	2.5		2.0
	Defaulted (180+ DPD, Denounced, %)	23.7	20.3	25.9	45.2		27.9
	180+ DPD (%)	*18.3*	*0.6*	*0.1*	*0.8*		*3.7*
	Denounced (%)	*5.3*	*19.7*	*25.8*	*44.4*		*24.2*
	Adjusted 90+ DPD[1] (%)	24.6	21.1	36.2	49.7		32.5
Loss Mitigation	Total Loss Mitigation	0.0	0.0	8.9	3.3		3.5
	Modified, Current (0-89 DPD, %)	*0.0*	*0.0*	*7.0*	*2.0*		*2.6*
	Modified, Delinquent (90+ DPD, Denounced %)	*0.0*	*0.0*	*1.9*	*1.3*		*0.9*
Security	Secured by Tangible Collateral (%)	100.0	100.0	100.0	100.0		100.0
Loan Characteristics	Number of Borrowers (K)	29.4	65.4	48.9	46.1	189.9	
	Number of Loans (K)	35.6	66.8	52.4	49.0	203.9	
	Average Loan Size (EUR K)	5.1	4.3	5.8	4.3		4.8
	WA Coupon (%)	7.5	8.5	8.1	10.4		8.6
	WA Seasoning Term (Months)[2]	50.5	38.0	42.5	44.3		43.1

1. Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been modified

2. Seasoning term is defined as months since modification date for modified loans and months since origination for non-modified loans

The Group A Bank Auto loan universe encompassed EUR 987 MM of current funded balance across approximately 204 K loans. NBG and Eurobank together accounted for over 60% of this balance, while Piraeus accounted for 21% and Alpha 18%.

Relative to other asset classes, 90+ DPD ratios were relatively low at 29.9%, although there was variance across the Banks. In comparison to Other Consumer Loans, loss mitigation activity was relatively muted at 3.5%, with only NBG and Piraeus being active in loss mitigation within the auto space.

3.2.2. Revolving Loan Stratifications

A summary Group A Bank Revolving loan portfolio stratification table is shown below. The stratification table provides a summary of each Bank's funded balance, average loan size; weighted average portfolio coupon; weighted average seasoning term; percentage of loans secured by tangible collateral; percentage of loans that have undergone Loss Mitigation; percentage of loans that are 90+ DPD; and percentage of loans that are "Adjusted 90+ DPD" (which covers 90+ DPD loans and loans which are Current and have been Modified).

Figure 42: Overview of Group A Bank Revolving Loan Portfolios

		Alpha	Eurobank	NBG	Piraeus	Group A Total	Group A Avg.
Portfolio Exposure	Funded (EUR MM)	1,655	2,302	2,682	2,091	8,730	
Performance Status	Current (0-89 DPD, %)	66.2	51.7	50.9	48.9		53.5
	Delinquent (90-179 DPD, %)	1.4	1.6	3.5	2.1		2.3
	Defaulted (180+ DPD, Denounced, %)	32.4	46.7	45.6	49.0		44.2
	180+ DPD (%)	*26.0*	*25.0*	*0.5*	*6.4*		*13.2*
	Denounced (%)	*6.4*	*21.6*	*45.1*	*42.5*		*31.0*
	Adjusted 90+ DPD[1] (%)	35.5	48.3	49.1	51.1		46.8
Loss Mitigation	Total Loss Mitigation	1.7	0.0	0.0	2.9		1.0
	Modified, Current (0-89 DPD, %)	*1.7*	*0.0*	*0.0*	*0.0*		*0.3*
	Modified, Delinquent (90+ DPD, Denounced %)	*0.0*	*0.0*	*0.0*	*2.9*		*0.7*
Security	Secured by Tangible Collateral (%)	0.0	3.8	0.0	1.7		1.4
Loan Characteristics	Number of Borrowers (K)	564.7	674.6	643.6	682.4	2,565.3	
	Number of Loans (K)	786.5	1,115.8	1,102.0	834.2	3,838.5	
	Average Loan Size (EUR K)	2.1	2.1	2.4	2.5		2.3
	WA Coupon (%)	14.5	16.9	14.6	14.2		15.1
	WA Seasoning Term (Months)[2]	106.5	103.3	111.1	87.1		102.4

1. Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been modified

2. Seasoning term is defined as months since modification date for modified loans and months since origination for non-modified loans

The Group A Bank Revolving Loan universe encompassed EUR 8.7 BN of current funded balance across approximately 3.8 MM loans. NBG, Eurobank and Piraeus collectively account for over 80% of market share.

Relative to other asset classes, loss mitigation activity for Revolving loans was generally low at 1.0%. Revolving loans had a higher weighted average current interest rate of 15.1%) compared to other Consumer asset classes.

3.2.3. Other Consumer Loans

A summary Group A Bank Other Consumer Loan portfolio stratification table is shown below. The stratification table provides a summary of each Bank's funded balance, average loan size; weighted average portfolio coupon; weighted average seasoning term; percentage of loans secured by tangible collateral; percentage of loans that have undergone Loss Mitigation; percentage of loans that are 90+ DPD; and percentage of loans that are "Adjusted 90+ DPD" (which covers 90+ DPD loans and loans which are Current and have been Modified).

Figure 43: Overview of Group A Bank Other Consumer Loan Portfolios

		Alpha	Eurobank	NBG	Piraeus	Group A Total	Group A Avg.
Portfolio Exposure	Funded (EUR MM)	3,136	4,321	2,872	3,783	14,112	
Performance Status	Current (0-89 DPD, %)	53.5	59.7	48.5	53.0		54.3
	Delinquent (90-179 DPD, %)	2.0	2.2	5.0	4.5		3.3
	Defaulted (180+ DPD, Denounced, %)	44.5	38.1	46.5	42.5		42.4
	180+ DPD (%)	*29.6*	*5.1*	*2.0*	*6.6*		*10.3*
	Denounced (%)	*14.9*	*33.0*	*44.5*	*35.9*		*32.1*
	Adjusted 90+ DPD[1] (%)	62.0	69.4	77.4	66.9		68.7
Loss Mitigation	Total Loss Mitigation	16.4	43.3	49.0	36.3		36.6
	Modified, Current (0-89 DPD, %)	*15.5*	*29.2*	*25.9*	*19.8*		*23.0*
	Modified, Delinquent (90+ DPD, Denounced %)	*0.9*	*14.2*	*23.1*	*16.4*		*13.6*
Security	Secured by Tangible Collateral (%)	13.9	50.5	12.7	35.3		30.6
Loan Characteristics	Number of Borrowers (K)	168.7	281.9	436.7	350.5	1,237.8	
	Number of Loans (K)	286.3	298.7	565.0	452.2	1,602.1	
	Average Loan Size (EUR K)	10.8	14.5	5.1	8.4		8.8
	WA Coupon (%)	10.3	8.0	9.0	10.2		9.3
	WA Seasoning Term (Months)[2]	34.4	25.3	33.3	35.3		31.6

1. Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been modified

2. Seasoning term is defined as months since modification date for modified loans and months since origination for non-modified loans

The Group A Bank Other Consumer universe encompassed EUR 14.1 BN of current funded balance across approximately 1.6 MM loans. Eurobank and Piraeus together account for approximately 57% of the total funded exposure.

The prevalence of loss mitigation activity varied significantly among the Banks, particularly for Alpha, for which only 16.4% of Other Consumer Loans were classified as Modified compared to 49.0% at NBG and 43.3% at Eurobank. 90+ DPD reported delinquency figures were generally within the 40-50% range, with Eurobank having the lowest 90+ DPD delinquencies (40.3%) and NBG having the highest (51.5%).

Other relevant risk factors included seasoning, whether a loan was secured by tangible collateral, and current funded balance.

3.3. Loan File Review

Consumer Loans loan file reviews were based on small samples when compared to the total portfolio size and selected according to certain sampling criteria presented in the following paragraphs. Therefore, any quantitative or qualitative results derived by BlackRock should not be extrapolated to apply to the entire portfolio from which the sample was taken. Results should be interpreted as directional and indicative in nature only. They should also only be assessed in conjunction with the results from other qualitative and quantitative processes performed during the AQR process.

BlackRock engaged Clayton to perform 2 separate reviews on a sample of consumer loan files to assess the each institution's (i) origination and underwriting practices; and (ii) loss mitigation practices

Origination and Underwriting Consumer Loan File Review

Clayton performed a review on a sample of 159 files covering all Group A Parent Bank portfolios and selected portfolios for recently merged entities. LFRs were conducted for two purposes: (i) to assess whether loans were originated in accordance with underwriting criteria in effect at the time of loan origination, or if subject to exceptions, that such exceptions were deemed as having sufficient compensating factors; and (ii) to assess whether the loan, beyond its adherence to criteria or exceptions, would be considered acceptable by a prudent lender.

The scope Clayton's assignment included provided the following services:

- Review of loan files including:
  - Application Form
  - Authorised Broker checks, as applicable
  - KYC documentation
  - Credit Search/Score where applicable and Teiresias check
  - Confirmation of income
  - DTI calculation
  - Debt Transfer – Last monthly statement for transferred loans
  - Underwriter notes if any – justification of decision if outside lending criteria and guidelines
- Loan evaluation and grading assessment
- Reporting

Sample Selection

Loan samples were determined through pre-defined criteria as well as random selection. For each Group A Bank, loan samples consisted of 15 consumer and 5 credit cards exposures.

The loan balances reviewed across the 4 Group A Parent Banks and recently acquired Group B Bank entities are as follows.

Figure 44: Loan Balances Reviewed in Samples

Bank	Number of files reviewed	Outstanding balance (EUR MM)
Parent Entities	**80**	**1.03**
NBG	20	0.18
Eurobank	20	0.21
Alpha	20	0.39
Piraeus	20	0.25
Recently Acquired Banks	**79**	**1.14**
TT (Eurobank)	11	0.20
Emporiki (Alpha)	20	0.30
ATE (Piraeus)	16	0.22
Cypriot Banks[1] (Piraeus)	16	0.23
Millennium (Piraeus)	8	0.12
Geniki (Piraeus)	8	0.07
Total	**159**	**2.17**

1. Includes Bank of Cyprus, Cyprus Popular Bank and Hellenic Bank

Review Process

Clayton provided grades for each loan reviewed on two distinct measures:

1. Criteria Grade - measures compliance with stated underwriting guidelines in effect at loan origination, accounting for any mitigating factors that may offset any guideline exceptions.

Criteria Grade	Criteria Grade Description
A	No exceptions to guidelines or origination documents were noted. The loan was considered to be underwritten in accordance with guidelines
B	Minor exceptions to guidelines or documents were noted. However, the nature of the exceptions was such that the loan would be considered in adherence with policy
C	One or more material exceptions to guidelines or documents were noted. However the loan had mitigating or compensating factors that would make the loan deemed as an acceptable risk
D	One or more material exceptions to guidelines or documents were noted. There were insufficient mitigating or compensating factors to offset the exceptions, and the granting of loan would have been considered at a level of risk outside of policy

2. Consultant Grade - overall grade measuring whether loan origination standards conform to generally accepted lending practices adopted by a prudent lender.

Consultant Grade	Consultant Grade Description
A	No exceptions to generally accepted practice by prudent Residential Mortgage / consumer lenders of like product were noted. The loan was considered to be acceptable.
B	Minor exceptions to generally accepted practices were noted. However, the nature of the exceptions was such that the loan would be considered acceptable by prudent residential consumer lenders of like product in the market.
C	One or more material exceptions to generally accepted practices were noted. However the loan had mitigating or compensating factors that would have allowed prudent residential consumer lenders of like product in the market to consider the loan to be acceptable on balance.
D	One or more material exceptions to generally accepted practices were noted. There were insufficient mitigating or compensating factors to offset the exceptions and the loan would be considered unacceptable by prudent lenders in the market.

Summary Findings

The results of the Origination and Underwriting LFR are shown in the Figure below. Reviewers did not have policy or procedure manuals for TT at the time of the review and therefore could not assign Criteria Grades for this Bank.

Figure 45: Consumer Origination and Underwriting Loan File Review Results

	Criteria Grades (% of Loan Count)				Consultant Grades (% of Loan Count)			
	A	**B**	**C**	**D**	**A**	**B**	**C**	**D**
Average of Parent Banks	66%	20%	5%	9%	35%	24%	19%	22%
Average of Acquired Banks	63%	16%	3%	18%	15%	43%	8%	34%
Total	**65%**	**18%**	**4%**	**13%**	**25%**	**33%**	**13%**	**29%**

1. Includes Bank of Cyprus, Cyprus Popular Bank and Hellenic Bank

When assigned a grade on their overall adherence to stated guidelines, over 80% of the sample across the 10 banks received a Criteria grading of either A or B, indicating that the Banks tended to have procedures that promoted compliance with the policy criteria. On the other hand, approximately 12% of the sample (graded with D) had exceptions that were outside the stated policies and were deemed unacceptable.

Less than 60% of the sample loans received a Consultant Grade of either A or B, being underwritten in accordance with prudent lending standards, while 28% of the sample received a Consultant Grade of D for having been originated with exceptions that were outside of generally accepted practices. Notably, Consumer loan files scored higher grades than Residential Mortgage loans both in terms of adherence to criteria/guidelines and in terms of following practices acceptable by prudent lenders of similar products.

Clayton noted several exceptions during the loan file reviews, and assigned grades based upon these exceptions. There were 8 categories of such exceptions, which are listed below, along with their descriptions:

- Income and affordability: income not verified or employment status/time in job unknown for borrower and/or co-borrower and/or guarantor, DTI limit exceeded, DTI calculated by consultant exceeds limit, other income/affordability issue
- Credit search: adverse showing on credit search (black and/or white Teiresias), pre-approval search missing, secondary search prior to completion missing, credit search approval missing, other credit search issues
- Know Your Customer (KYC): signatures and/or date of birth does not match across documents, ID issues, proof of address missing
- Consumer loans: consumer loan purpose issue
- Application: application not signed or outdated (over 6 months), borrower(s)/guarantor age issue, debt transfer documents missing, guarantor relationship unknown, marital status related issues, non-disclosed income issues, old account conduct not assessed, or not properly assessed
- Contract and legals: issues with address of liens, correct credit agreement issues, other contract or legal issues
- Auto loans: car invoice missing

During the file review, 361 exceptions were observed and grouped in the aforementioned categories as described in the Figure below.

Figure 46: Exceptions Observed in Consumer Loans Origination and Underwriting Loan File Review

Consumer Loans – Exceptions			
Exception Category	**Criteria Exceptions[1]**	**Consultant Exceptions[1]**	**Total[1]**
Income and Affordability	51	124	175
Credit Search	11	42	53
KYC	16	32	48
Consumer loans	2	45	47
Application and Bins	8	22	30
Contract and Legals	2	3	5
Auto Loans	-	3	3
Total	**90**	**271**	**361**

1 Excluding exceptions of TT and Probank

The LFR results indicate that the criteria-related exceptions are less frequent than exceptions identified by the reviewer that are related to practices inconsistent with prudent lender standards. Similar to Residential Mortgages, the results indicate that the banks tend to approve exceptions to their credit policies in the area of income and affordability assessment (51 exceptions, over 55% of all criteria-related exceptions). Exceptions related to compliance with KYC (16 cases) and credit search (11 cases) policies were also observed relatively often.

Regarding exceptions identified by the reviewer related to prudent lender standards, the majority of the issues for consumer loans related to income and affordability assessment, with 124 exceptions observed. There were also 48 exceptions related to DTI calculations or violations of a reasonable DTI limit, often related to inappropriate assessment of income. Borrower employment status and time in job issues were observed in 38 instances, while an additional 18 exceptions were noted for co-borrower's and guarantor's employment status/details.

Credit search-related issues were noted in 42 instances. In 20 cases, information from the adverse 'white' Teiresias credit search results (service offered by Teiresias since 2005 not sufficiently assessed), and in five cases the 'black-list' adverse Teiresias results were not appropriately considered in the loan decision. Finally, there was no evidence of a pre-approval credit search in eight files.

KYC-related exceptions were identified in 32 cases, mostly related to signatures not matching among different documents and insufficient proof of address. Mismatches in signatures (13 cases) were often due to the age of the signature samples documents (e.g., IDs) that were issued a decade or more prior to loan application. In those cases, signature validation was completed through comparison with more recent documents like tax declaration forms. Furthermore, proof of address was missing in 14 cases. Since 2008, regulation imposed on banks stricter criteria to validate the borrower's address. Prior to that date in was common practice for lenders to use tax documents as proof of address. However, these tax documents are generally not a good source since some individuals show alternate addresses in those documents.

Regarding application completeness, the most frequent exceptions noticed were the assessment of prior account history (or improper assessment) and the omission of debt transfer documentation, observed in 7 and 6 cases respectively.

Loss Mitigation Consumer Loan File Review

This review formed part of BlackRock's Troubled Asset Review ("TAR") and encompassed a sample of 20 Consumer Loans for each of the 4 Group A Parent Banks. This review assessed whether loss mitigation actions (i.e., forbearance, refinancing, rescheduling, or restructuring) were undertaken with or without a rationale consistent with that of a prudent lender (as it relates to areas such as borrower affordability and willingness and/or ability to pay) and if, subject to exceptions, such exceptions were generally in line with those of a prudent lender.

Sample Selection

Included within this review were only Consumer Loans Modified in 2012 or 2013. It excluded auto loans and credit cards, loans with an outstanding balance of less than EUR 1 K or credit originated by Dixons. Each 20-loan sample per Bank was constructed such that 16 loans (80% of cases) were less than EUR 50 K, while 4 remaining cases were each over EUR 50 K. The loan balances reviewed per Group A Parent Bank are as follows:

Figure 47: Loan Balances Reviewed in Sample

Bank	Number of files reviewed	Outstanding balance (EUR MM)
NBG	20	0.35
Eurobank	20	0.35
Alpha	20	0.45
Piraeus	20	0.42
Total	**80**	**1.57**

Review Process

Each case was given a different grade by the reviewers based on exceptions observed as follows:

Grade	Grade Description
A	No exceptions to guidelines, documents or, as applicable, generally accepted practice by prudent consumer lenders, of like product, in the market were noted. The loss mitigation solution offered is considered to be acceptable.

B	Minor exceptions to guidelines, documents or, as applicable, generally accepted practices were noted. However, the nature of the exceptions was such that the loss mitigation would be considered acceptable by prudent consumer lenders of like product in the market.
C	One or more material exceptions to guidelines, documents or, as applicable, generally accepted practices were noted. However the loss mitigation solution offered had mitigating or compensating factors that would allow prudent consumer lenders of like product in the market to consider the loan to be acceptable on balance.
D	One or more material exceptions to guidelines, documents or, as applicable, generally accepted practices were noted. There were insufficient mitigating or compensating factors to offset the exceptions and the loan would be considered unacceptable by prudent lenders of like product in the market.

Summary Findings

The results of the Loss Mitigation Loan File review for Consumer Loans are shown below:

Figure 48: Consumer Loans Loss Mitigation Loan File Review Results

	Grade Loan Summary (% of Loan Count)			
	A	B	C	D
Total Average	14%	11%	26%	49%

When assigned a grade on their overall adherence to loss mitigation guidelines, approximately 25% of the total sample received a Criteria Grade of either A or B, indicating that the Banks did not tend to adhere to practices generally accepted by prudent lenders of similar products. On the other hand, almost 50% of the sample was outside of prudent lending standards. These scores are lower than the ones attributed during the AQR Consumer Loans LFR which is primarily due to a more adverse selection of this sample.

A total of 218 exceptions were noted during the loan file review. Reviewers categorised the exceptions in 3 main categories, each of which is listed and described as follows:

- Post completion evident risk: Arrears likely to increase, issues related to borrower performance across other accounts, affordability and other debt assessment, borrower's unemployment status, other lender litigation, high LTV issues, arrangements with other lenders and other risks/issues
- Restructuring: Accounts likely to default after modification, restructuring/modification activities not being successful, appropriate, reasonable, or favourable for the borrower, presence of multiple modifications per loan, payment history not being assessed prior to modification, arrangements with other lenders and other restructuring related issues
- Payment performance and collections: Including exceptions related to no dialogue (or ineffective dialogue) with borrowers, collections activities not timely or not in accordance with SLA, and reason for arrears not established

These exceptions, broken out by major category and sub-category are illustrated in the following table.

Figure 49: Exceptions Observed in Consumer Loans Loss Mitigation Loan File Reviews

Exception sub-category	Total
Post completion evident risk	**129**
• Arrears likely to increase	*36*
• Affordability or other debt issues	*33*
• Borrower unemployed	*24*
• Other accounts performance	*12*
• Other exceptions (in 8 sub-categories)	*24*

Restructuring	**83**
• Multiple restructurings/modifications per loan	*22*
• Restructuring/Modification not appropriate, not reasonable, not within criteria or not all options considered	*20*
• Account likely to default after restructuring/modification	*20*
• Restructuring/modification activities not successful	*17*
• Other exceptions (in 3 sub-categories)	*4*
Payment performance and collections (in 3 sub categories)	**6**
Total	**218**

Common exceptions observed in the review included "Arrears likely to increase" (observed in 36 instances) and "Accounts likely to default after the modification" (observed in 20 cases). These types of exceptions are indicative of the loss mitigation practices across the 4 Group A Banks that were viewed as a short-term means to accommodate borrower distress instead of a meaningful and sustainable restructuring of loan terms.

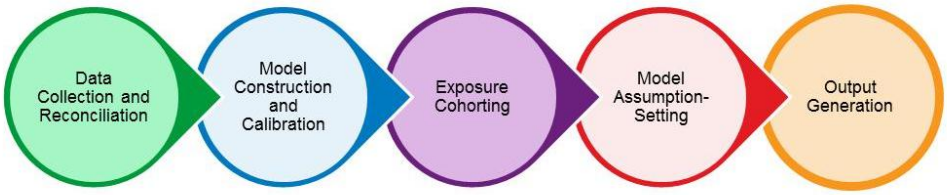
Furthermore, the Banks often approved inappropriate or unreasonable loan mitigation solutions not within criteria (20 cases) and overlooked critical viability checks like affordability and other debt assessments (observed in 33 cases) and borrower performance across other accounts (in 12 cases). Occasionally, Banks had to offer subsequent modifications (22 cases) or provide solutions to unemployed (24 cases).

3.4. Modelling Methodology

3.4.1. General Approach

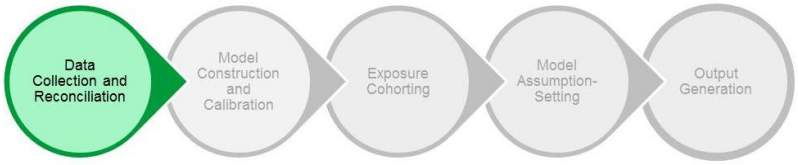
BlackRock utilised a bottom-up approach in generating credit loss projections. The process commenced with the collection of cross-sectional data for relevant exposures, stratification of these exposures, and analysis of historical loan performance to identify risk drivers and fundamental loan characteristics with predictive capabilities. BlackRock then constructed and calibrated the Consumer Loan model based on these risk drivers, while incorporating assumptions generated from the aforementioned observations to produce loss/recovery estimates. The various steps are illustrated below.

Figure 50: Consumer Loans - General Credit Loss Projections (CLP) Approach



Further detail on each step is outlined below:

Step 1 of 5: Data Collection (and Reconciliation)



The model leveraged a panel dataset which is both cross-sectional and historical in nature.

Cross-sectional data: The Consumer Loan asset class encompasses all Auto, Revolving, and Other Consumer loans. BlackRock requested that the Banks identify, collect, and submit aggregated (and granular) statistics relating to these exposures (e.g., total balances, exposures size, geographic spread, vintage distribution, collateral information).

BlackRock also requested that Banks submit granular data via a standardised template containing fields with common key term definitions, to pre-empt inconsistencies resulting from the differing data frameworks and nomenclatures employed across the Banks. This cross sectional data, reflecting exposures as of the Reference Date, 30 June 2013, included:

- Borrower characteristics – Unique identifier[22], employment status, borrower location, borrower age, etc.
- Loan characteristics – Loan product type, balance, origination date, coupon structure, remaining term, etc.
- Performance – Current arrears status and recent history, arrears balance, loan modification history, etc.
- Collateral information – Collateral location, collateral type, origination appraisal, lien information, etc.

Historical data: BlackRock also analysed subsets of historical data to capture dynamic credit performance over time, including the following:

- Bank-specific delinquency data: 5 year historical time series, showing the delinquency profile of Group A Banks' Consumer Loan exposures at quarterly intervals. Due to various issues, data from certain Banks could not be used; FBB did not provide historical data; CPB did not provide historic data on denounced loans; Alpha only had yearly data (whereas the model required quarterly data); unintuitive data patterns precluded the use of submissions from Hellenic and issues related to ATE good Bank data are detailed further in *Step 2 of 5: Model Construction and Calibration*
- Bank-specific loan payment history: Payment history for exposures which had been paid down fully over the 5 year historical time period, ending 30 June 2013. For this, only data from Piraeus was used. Further detail on how this was incorporated into the model is included in *Step 2 of 5: Model Construction and Calibration*

BlackRock performed a verification of cross-sectional and historical data by comparing it against various other sources, such as supervisory reports provided by the Bank of Greece, Bank presentations, the Banks' various audited and unaudited financial statements, as well as data previously submitted for the 2011 Diagnostic. This was an iterative and interactive process between BlackRock and the Banks, whereby any errors in submissions, as well as potential inconsistencies therein were communicated to the Banks and subsequently addressed through clarifying communication and appropriate reconciliations where necessary.

The multi-pronged coverage presented by both the cross-sectional data, as well as the various Bank-specific and selected historical time series, informed the subsequent model calibration process, allowing the model to better accommodate the dynamic and time-varying elements of various factors driving credit performance.

Step 2 of 5: Model Construction and Calibration

[22] For Banks that had recently acquired institutions (Alpha, NBG and Piraeus), BlackRock requested a unique identifier covering the Parent Bank and its acquired Banks.

BlackRock developed the Greek Consumer Loan model using a transition matrix framework (also known as the "Transition Matrix Model"), whereby the projected loss for any specific exposure is estimated by first taking into account the probability that the given exposure becomes delinquent, followed by default, and upon the point of liquidation thereafter, experiences a loss severity on the outstanding balance owed. Furthermore, the model computed this outstanding balance as a function of contractual amortisation through periodic instalments, as well as any potential prepayments.

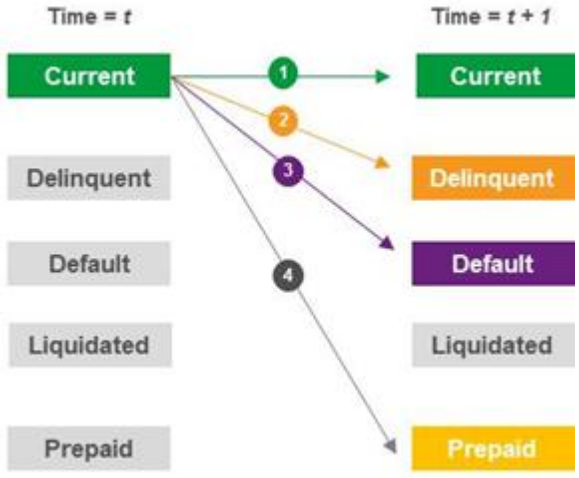
For modelling purposes, active loans were classified into one of three initial states; "Current", "Delinquent", or "Default", which were determined by the initial arrears (DPD) status, standardised across the Banks. Additionally, loans may become Liquidated or Prepaid, as per the Figure below.

Figure 51: Consumer - Loans Model loan state definitions

Payment status	BlackRock Model Definition
Current	0 – 89 DPD
Delinquent	90 – 179 DPD
Default[23]	180+ DPD
Liquidated	Occurs upon the sale of underlying collateral
Prepaid	Redemption of the outstanding loan balance ahead of the contractual schedule[24]

Note: In addition to these loan states above, loans may pay down according to their contractual payment schedules, and therefore become fully amortised. The likelihood of moving from one of these states to another is a function of several factors including, but not limited to, loan, borrower, and collateral characteristics. External factors, such as employment, interest rates and general economic activity also drive credit performance. For instance, the possible transitions which may occur to a loan in Current status at Time *t* are illustrated below.

Figure 52: Single-period transition possibilities for a Current loan in the Consumer Loans model



A loan which is Current at time *t* (i.e., between 0 and 89 DPD) may subsequently go on to make one of the following transitions:

1. Stay Current, through payment of the necessary monthly instalment amounts, or;
2. Become Delinquent (defined as 90 to 179 DPD) due to missed payments, or;
3. Established borrower unwillingness or inability to continue satisfying loan terms may cause expedited transition into Default, or;
4. Become fully paid down ("prepaid"), in which case, the borrower has chosen to satisfy the total balance of the loan by paying all amounts owed

Additionally, between *t* and *t+1*, other exposures in the other loan states such as Delinquent and Default, may experience their own transitions, driven by exposure-specific factors and external variables

The quarterly transition matrices used to project the likelihood of loans moving between these states (as informed by the statistical relationships and risk drivers) were combined with a cashflow logic that employs

[23] Includes loans in Legal or that have been denounced

[24] Prepay assumptions are not applicable for revolving products (such as credit cards)

periodic amortisation to determine outstanding loan balances at various points in time. The framework is illustrated in the Figure below.

Figure 53: Credit loss framework within the Consumer loan model

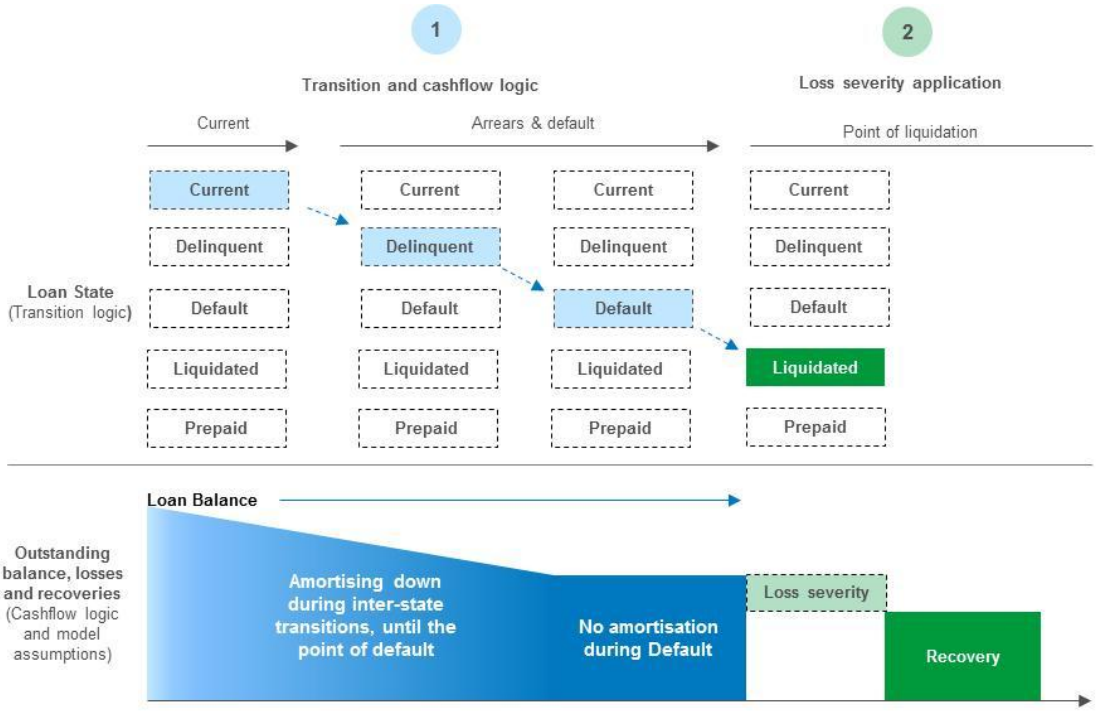


*Diagram above demonstrates a simplified 3-step transition for a Current loan at time *t*=0. Actual inter-state model transitions may be more complex

Quarterly transitions between loan states are assembled in a time-varying matrix like the one illustrated in the Figure below. Each row of the matrix must sum to one, and each element of the matrix not equal to 0 or 1 is a function of the loan-specific characteristics (both static and dynamic) and external variables. For instance $P_{cd}(x_{it})$ is the probability that loan "i" with characteristics "x" at time "t" will transition from Current to Delinquent. The set of factors "x" will also generally include macroeconomic factors.

Figure 54: Transition Matrix Modelling

		Time = t+1				
		Current	Delinquent	Default	Prepaid	Liquidated
Time = t	Current	$P_{cc}(x_{it})$	$P_{cd}(x_{it})$	$P_{cf}(x_{it})$	$P_{cp}(x_{it})$	0
	Delinquent	$P_{dc}(x_{it})$	$P_{dd}(x_{it})$	$P_{df}(x_{it})$	0	0
	Default	$P_{fc}(x_{it})$	$P_{fd}(x_{it})$	$P_{ff}(x_{it})$	0	$P_{fl}(x_{it})$
	Prepaid	0	0	0	1	0
	Liquidated	0	0	0	0	1

The identification of significant risk drivers influencing these transitions began with the previously detailed data stratification exercise where BlackRock performed multiple iterations of exposure classification and categorisation in order to isolate patterns that could potentially drive underlying credit performance (e.g., unemployment levels, interest rates, loan seasoning). Once identified, BlackRock tested these factors for statistical significance by performing a series of multinomial logistic regressions, and subsequently selected the combination of explanatory variables which optimised each models' overall predictive capability.

BlackRock used data from NBG (excluding FBB originated loans), Eurobank, and Piraeus Bank (including several affiliates) for estimation purposes. BlackRock excluded data from Alpha, as annual, as opposed to quarterly, loan transitions were provided. BlackRock also excluded certain Piraeus affiliates, including CPB and Hellenic Bank, as historical information submitted was deemed to be insufficient.

Missing Transitions

The dataset used for model estimation consisted of a panel dataset of loans that had an outstanding balance on 30 June 2013. Any loans that had been redeemed either by prepayment or scheduled amortisation during the preceding 5 year performance window were not in the dataset. These redeemed loans were most likely current in the quarters immediately prior to redemption. Therefore our estimate of the $P_{cc}(x_{it})$ transition is most likely downwardly biased. To correct this bias, a dataset from Piraeus consisting of all loans that redeemed, without a loss to the Bank, over the 5 year performance window was analysed. This dataset was used to approximate the missing number of transitions in the $P_{cc}(x_{it})$ cell of the matrix. Once this estimate was obtained, the intercepts in the logistic equations governing the first row of the matrix were adjusted to bring the $P_{cc}(x_{it})$ in line with its unbiased estimate. The same adjustment was then applied to all Banks on the assumption that the bias was the same for all portfolios.

ATE Good Bank

ATE Bank's data was excluded from the model estimation because its transitions are intrinsically biased. A large percentage of non-performing loans were removed from the balance sheet before the entity was acquired by Piraeus. If these transitions were included in the estimation, the Pcd(xit) transition would most likely be downwardly biased, i.e., have a reducing impact on projected PDs. Secondly, scoring ATE Good Bank through a model built on banks with good and bad assets would risk biasing its default and loss projections upwards. To correct for this potential bias, ATE Good Bank's historical data (available since the Piraeus acquisition date in July 2012) was passed through the model estimation (with a "missing transition" adjustment in place) and the actual Pcd(·) transition was compared to the predicted Pcd(·) transition. Subsequently, an ATE-specific intercept adjustment was made to correct for the observed error.

Below is a list of explanatory variables and relevant intercepts employed by BlackRock's Consumer Loans model to predict quarterly Current to Delinquent transitions for non-Modified term loans. This Figure below ranks the variables within the BlackRock Consumer transition matrix model in order of statistical significance, and also indicates the level of confidence that the factor is a significant driver of performance and thus should be included in the model. The Figure below does not indicate the importance of each of the factors for explaining variation either over time or between portfolios for the Credit Loss Projections.

For a full list of the suite of explanatory variables employed by BlackRock's Consumer Loans model, please see Appendix – Retail.

Figure 55: Consumer loan model explanatory variables and intercepts

Prob (Current->Delinquent) Non-Modified Loans	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Loan Coupon	1	+	9,393.8	1%
ln(Loan Age+1)	2	+	2,113.6	1%
Δ in Unemployment (Year on Year)	3	+	2,064.5	1%
Loan Age	4	-	1,173.2	1%
Δ in Real GDP (Year on Year)	5	-	94.8	1%
Mortgage Backed (0,1)	A	+	2,106.7	1%
Employment Status Categories	B	dependent on category	2,097.7	1%
Fixed Coupon (0,1)	C	+	1,013.9	1%
Dixon Loan (0,1)	D	-	672.4	1%
Green Loan (0,1)	E	-	578.2	1%
Borrower Location Categories	F	dependent on category	177.2	1%
Government Guaranteed Loan (0,1)	G	+	90.7	1%
Interest Only Loan (0,1)	H	-	9.3	1%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories
3. These macro factors had their estimates bounded to be no less than the fitted effect observed for non-modified term loans

The most important variables in explaining the probability of default (PD) for the Consumer asset class are (a) the current status of the loan, (b) the modification status and, (c) the macroeconomic variables.

- Modification flags: Borrowers who have experienced a temporary or permanent reduction in their capacity to service their loan payments are commonly offered a modification to their loan terms by their lender. In order for these to be considered sustainable, the amended terms should represent an affordable solution for the borrower. Difficulties arise when Banks provide short-term solutions to borrowers with permanently diminished payment capacity, which results in high re-default rates
- Current loan coupon: The current coupon/interest rate (level) paid by a borrower on a loan. High interest rates generally reduce loan affordability, and increase the likelihood of a decline in borrower credit performance. Additionally, the interest rate level at the time of origination may be considered a key credit risk indicator, as lenders typically charge higher interest rates to riskier borrowers at origination

  Current loan coupon is the most significant dynamic variable for the model highlighted above
- Seasoning (or Loan age): Defined as the amount of the time that the loan has been outstanding. Seasoning tends to have a non-monotonic relationship with credit performance. At and around the time of loan origination, borrower financial capacity, economic conditions, and loan terms (such as coupon, monthly instalment size, etc.) are all typically well-aligned, resulting in a low likelihood of quick deterioration in credit performance. Over time, as the conditions change, the cumulative burden of periodic loan obligations, changing borrower financial capacity and economic conditions increases the likelihood that some loans age into delinquency, and default. Later in the loan life cycle, increased seasoning tends to drive down propensity to become delinquent and to default. The combination of these dynamics imply a hump-shaped seasoning-versus-delinquency/default curve

  ln(Loan Age + 1) and Loan Age are the 2nd and 4th most significant dynamic variables for the model highlighted above
- Unemployment: The change in unemployment is another relevant measure of current economic conditions, as it can result in a significant shock to a borrower's ability to pay, in turn affecting the performance of Consumer Loans. As shown in the tables above, BlackRock observed a positive correlation between change in unemployment levels and transition probabilities into worse loan states
- GDP: BlackRock found that the change in the level of economic activity as measured by Real GDP is a factor in explaining the performance of Consumer Loans across all delinquency buckets. BlackRock used the year-on-year change in real GDP to smooth seasonality effects. GDP growth has a positive effect on curing transitions and a negative effect on transitions to worse performing states

- Fixed-rate: The fixed-rate factor generally tends to reduce the likelihood of credit deterioration, as loan payments are known over time. This contrasts with the variability of floating-rate products, where unanticipated and potentially large increases in required loan instalments may prove unsustainable for the borrower. Lenders typically charge fixed interest rates to borrowers deemed as low risk, so to some extent, the fixed-rate interest rate type may be considered as an indicator of low credit risk

Loss Severity Modelling

During the AQR due diligence process and through the detailed stratification and standardisation of the Bank provided collateral tapes and loan tapes, BlackRock verified its understanding of the Banks' consumer lending products and the quality of the associated collateral.

As part of the process, BlackRock requested that the Banks include details of their recovery experience on different collateral types and subsequently discussed this in detail with the Banks during the AQR due diligence meetings. The Banks also provided details of assumptions utilised in their internal behavioural models, where applicable, related to the collateral supporting their consumer lending products. BlackRock further performed an analysis of detailed data provided by Credicom in relation to recovery experience in their auto financing business.

BlackRock reviewed the Bank submissions and statements and compared them to research on severities and recoveries experienced in stressed environments in other jurisdictions. BlackRock similarly analysed how severities and recoveries develop over time as economic environments improve. BlackRock also incorporated standard assumptions used in modelling risk collateralised by these collateral types.

As a result of this process, BlackRock derived loss severity assumptions for Consumer Loans, as provided in the table below.

Figure 56: Consumer Loans Loss Severity Assumptions

	Loss Severity Assumption	
Consumer Product Type	**Base Case**	**Adverse Case**
Automotive Loans	55%	65%
Revolving Loans	80%	90%
Other Consumer Loans: Unsecured	80%	90%
Other Consumer Loans: Secured	75%	85%
Other Consumer Loans: Mortgage Backed	75%	85%
Other Consumer Loans: Green	35%	40%
Dixon Loans	0%	0%

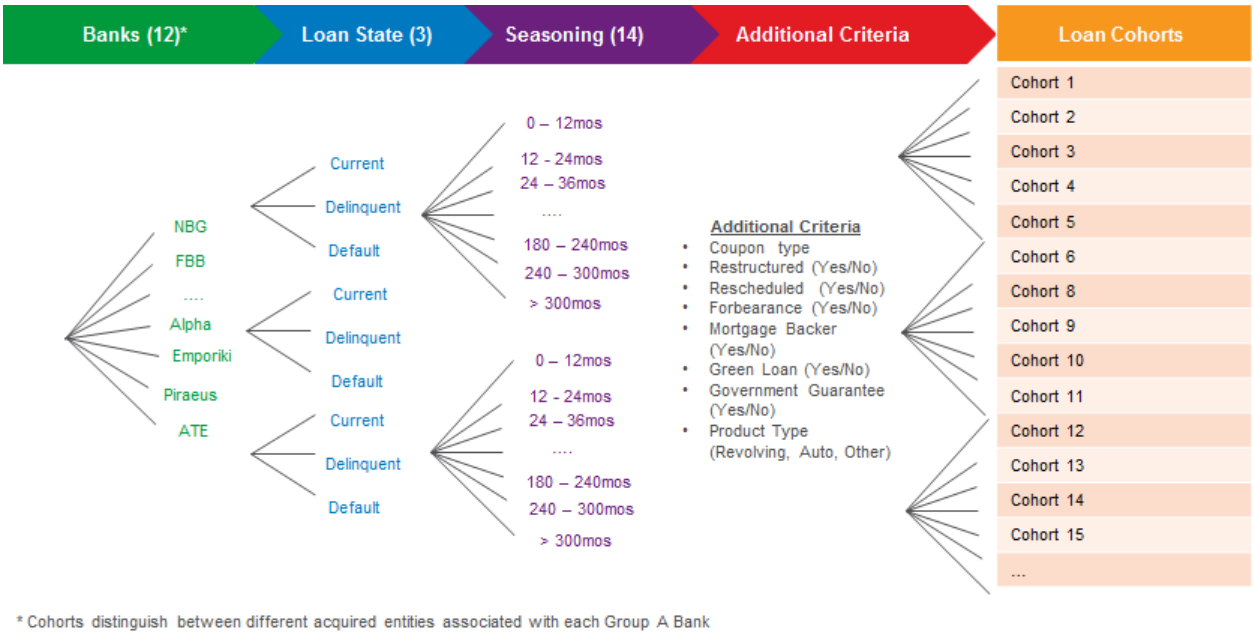
Step 3 of 5: Cohorting of Loan Data

To enhance the operational efficiency of the model, BlackRock placed each loan into a category (or "cohort") with other exposures that shared meaningfully similar attributes and characteristics. From a modelling perspective, each of these cohorts represents one line, which adopts the aggregated or average attributes of

the individual loans it subsumes. For example, the total balance of a cohort is the sum of all loan balances within that cohort, while the corresponding coupon of that cohort becomes the balance-weighted average of its individual constituents.

Each of these cohorts was constructed based on attributes that mirror the explanatory variables in Figure 57. A snapshot of the cohorting logic used for this model is shown in the Figure below.

Figure 57: Cohorting waterfall: selected criteria



* Cohorts distinguish between different acquired entities associated with each Group A Bank

Cohorting is generally an iterative process, in which a set of criteria believed to have strong predictive relationships with loan performance (as informed by data stratifications and preliminary regression analyses) is selected, implemented, and tested until sufficient operational efficiency, subject to the constraint of preserving model accuracy through data granularity, is achieved. In this regard, the less granular the cohorts, the less operationally burdensome model execution becomes. However, cohorts should not be too "lumpy", as relevant (but relatively nuanced) exposure characteristics may not be incorporated due to the "averaging" process that cohort construction entails, thereby diminishing the explanatory contributions of these attributes and jeopardising output accuracy. Also, lumpy cohorts will generate convexity biases that may impact model accuracy in unexpected ways.

To get an aggregate view of losses for the entire portfolio, individual cohort results, as produced by the model, were summed.

Step 4 of 5: Model Assumption-Setting

Institutional knowledge garnered through due diligence reviews and ongoing Bank correspondence, as well as specific market intelligence exercises, facilitated the development and application of informed assumptions that were crucial to the final operation of the Consumer Loan model. These assumptions related to loan behaviour, Bank practices, and projections regarding the macroeconomic variables.

Forward Looking Economic Assumptions

BlackRock utilised macroeconomic forecasts provided by the Bank of Greece for factors such as unemployment, GDP, and interest rates. The forward paths of these variables, as well as their relative trajectories across both the Base and Adverse Cases, were key components to the CLP framework within the Consumer Loan model. The forward curves incorporated into the model are shown in Section 1.4.

Liquidation Timeline

Key assumptions were made with respect to the realisation of Consumer Loan losses and recoveries, with the goal of gaining additional clarity around the average workout period from default to liquidation across Consumer Loan sub-asset classes. For Revolving Loans and Auto Loans, BlackRock assumed that the average workout period from default to liquidation is 2.5 years. For Other Consumer Loans, BlackRock assumed that the average workout period from default to liquidation is between 3 and 4 years. These timelines were informed by the AQR and TAR due diligence process, where legal workout was a key topic covered with the Banks. These timelines were verified through external research on the Greek market and other relevant jurisdictions and through discussion of the legal process with local Greek legal experts.

Other key model assumptions:

- Exposure at default: BlackRock considered only the funded balance of Consumer loans
- Delinquent loan pay rate: The percentage of the due installment that is paid for delinquent Consumer loans is assumed to be 25%. This was determined from the historic data provided by the Banks and is consistent with assumptions in other jurisdictions
- Defaulted loan pay rate: Defaulted loans were assumed to pay no interest or principal
- Prepayment: Auto Loans prepay at an annual rate of 1%; Other Consumer Loans prepay at an annual rate of 1.5%
- Revolving loan amortisation: Revolving loans are assumed to amortise at a rate of 2.5% per month
- *Revolving percentage*: Current/Open Revolving loans are assumed to make their minimum payments due (2.5%) and subsequently redraw 40% of the previous period's payment. Current/Closed and Delinquent Revolving loans are assumed to make their minimum payments due (2.5%), with no subsequent redraws. Defaulted Revolving loans are assumed to not make their minimum payments due
- Government-guaranteed loans: For government-guaranteed loans, losses were assumed to be 0%

Step 5 of 5: Output Generation

Each cohort was individually run through the model, using the aggregate and weighted -average characteristics of its constituents to determine projections for prepayment, default, delinquency, and loss severity. Model results were aggregated across these cohorts and summed to determine overall portfolio performance. For this analysis, BlackRock focused on the following time horizons: 1-year, 2-year, 3-year, and lifetime. Model outputs were also compared across the Banks to confirm that results reflect BlackRock's due diligence findings (e.g., Banks with more conservative underwriting and/or more assertive and organised collection efforts should incur lower losses).

Losses (projected to occur at the point of liquidation) were reported "at the Time of Default". For any given period, Loss at the Time of Default is the sum of all future losses associated with any balances that transition to 90+ DPD during that period. This calculation is provided for time zero (i.e. for loans that were 90+ DPD as of

the Reference Date), years 1, 2, and 3 (i.e. for balances that transition into 90+ DPD at any point within 1, 2, and 3 years, respectively), and lifetime (for balances that transition into 90+ DPD at any point into the future).

To provide a sense of the Goodness-of-Fit for the model components created by the logistic regression, Concordance Indices for various subsamples are provided below. This statistic measures the rank-ordering capability of probabilistic choice models. For Auto and Other Term loans, the full sample refers to the model fit that was tested on the full 5-year dataset and for Revolvers, one full year.

The in-sample model was fit on the dataset through the end of 2012 for Auto loans and Other Term loans, and the last two transitions were held out. For Revolving loans, only the last transition was held out. These models were then tested on the in-sample datasets, and out-of-sample on the remaining transitions. Overall, the component models perform well out-of-sample, in that there is only a modest deterioration in rank-ordering capability.

Figure 58: Consumer Loans In and out-of-sample Test Results

Asset Class	Transition(s)	Sample[1]	Concordance Index[2]
Auto Loans	Prob(Current->Delinquent)	Full Sample	74.5%
Auto Loans	Prob(Current->Delinquent)	In-Sample	75.4%
Auto Loans	Prob(Current->Delinquent)	Out-of-Sample	66.4%
Auto Loans	Prob(Delinquent->Current)	Full Sample	61.8%
Auto Loans	Prob(Delinquent->Current)	In-Sample	62.5%
Auto Loans	Prob(Delinquent->Current)	Out-of-Sample	58.2%
Auto Loans	Prob(Delinquent->Default)	Full Sample	60.0%
Auto Loans	Prob(Delinquent->Default)	In-Sample	58.4%
Auto Loans	Prob(Delinquent->Default)	Out-of-Sample	58.2%
Revolving Loans	Prob(Current->Delinquent)	Full Sample	60.0%
Revolving Loans	Prob(Current->Delinquent)	In-Sample	59.8%
Revolving Loans	Prob(Current->Delinquent)	Out-of-Sample	60.1%
Revolving Loans	Prob(Delinquent->Current)	Full Sample	60.4%
Revolving Loans	Prob(Delinquent->Current)	In-Sample	61.2%
Revolving Loans	Prob(Delinquent->Current)	Out-of-Sample	54.7%
Revolving Loans	Prob(Delinquent->Default)	Full Sample	62.7%
Revolving Loans	Prob(Delinquent->Default)	In-Sample	63.3%
Revolving Loans	Prob(Delinquent->Default)	Out-of-Sample	61.1%
Term Loans	Prob(Current->Delinquent or Default)	Full Sample	67.9%
Term Loans	Prob(Current->Delinquent or Default)	In-Sample	67.6%
Term Loans	Prob(Current->Delinquent or Default)	Out-of-Sample	66.6%
Term Loans	Prob(Delinquent->Current)	Full Sample	69.3%
Term Loans	Prob(Delinquent->Current)	In-Sample	70.4%
Term Loans	Prob(Delinquent->Current)	Out-of-Sample	62.8%
Term Loans	Prob(Delinquent->Default)	Full Sample	70.2%
Term Loans	Prob(Delinquent->Default)	In-Sample	70.2%
Term Loans	Prob(Delinquent->Default)	Out-of-Sample	67.4%

1. For Auto Loans, and Term Loans, the last two transitions were set aside for out-of-sample testing. For Revolving loans, the last transition was held out. The "Full" Sample refers to the complete dataset, and the model that was used for computing the CLPs.

2. The Concordance Index is obtained from: $C = (n_c + 0.5*(t - n_c - n_d))/t$, where n_c = # of pairs concordant, n_d = # of pairs discordant, and t = # of pairs with different responses.

3. This rank-ordering statistic is depressed by a large number of "ties" in the out-of-sample dataset. The ties arise from the fact that this component of the transition matrix is driven largely by macroeconomic factors, for which there is little variation on the out-of-sample dataset.

3.5. Group B Banks

3.5.1. Portfolio Stratifications

BlackRock produced summary stratification tables of the dataset and reviewed the key portfolio characteristics and risk drivers. Due to time constraints, these reports were not separately shared with the Group B Banks. However, each of the Group B Banks was asked to submit basic balance reconciliation data, including summary tables containing key data fields such as Current Funded Balance and percentage of Non-Performing Loans, to aid BlackRock in checking the general accuracy of data file being analysed.

Where necessary, BlackRock communicated with each Bank to seek clarification regarding specific inconsistencies or other issues identified by BlackRock. These concerns were addressed by the Banks to the extent practical in given the compressed time frame during which this analysis was conducted.

A stratification of all Consumer Loan exposures across the full spectrum of Group B Banks is shown below.

Figure 59: Consumer Loan Stratifications

		Attica Bank	Credicom	Panellinia	Probank	Proton (Good Bank)	TT Hellenic Postbank	Group B Total	Group B Avg.
Portfolio Exposure	Funded (EUR MM)	288	347	12	48	29	1,115	1,839	
Performance Status	Current (0-89 DPD, %)	41.9	81.4	60.8	90.0	83.3	84.3		77.1
	Delinquent (90-179 DPD, %)	4.3	1.4	1.0	3.9	16.6	3.0		3.2
	Defaulted (180+ DPD, Denounced, %)	53.8	17.2	38.2	6.1	0.2	12.6		19.7
	Adjusted 90+ DPD[1] (%)	58.3	25.0	60.3	17.8	24.2	21.6		28.2
Loss Mitigation	Total Loss Mitigation	7.8	8.6	21.5	7.9	8.3	7.4		7.8
	Modified, Current (0-89 DPD, %)	0.2	6.4	21.1	7.8	7.5	5.9		5.3
	Modified, Delinquent (90+ DPD, Denounced %)	7.6	2.3	0.4	0.1	0.8	1.5		2.5
Security	Secured by Tangible Collateral (%)	0.0	96.4	30.7	2.7	29.8	10.6		25.3
Loan Characteristics	Number of Borrowers (K)	42.2	88.3	2.2	83.9	0.9	132.3	349.7	
	Number of Loans (K)	49.0	103.3	2.8	86.3	0.9	160.7	402.9	
	Average Loan Size (EUR K)	5.9	3.4	4.4	0.6	30.8	6.9		4.6
	WA Coupon (%)	10.6	7.7	10.5	12.9	7.7	7.9		8.5
	WA Seasoning Term (Months)[2]	80.1	39.9	36.1	64.1	11.8	47.4		50.9

1. Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been modified

2. Seasoning term is defined as months since modification date for modified loans and months since origination for non-modified loans

3.5.2. Methodology Overview

The primary difference from the method used for the Group A Banks was that BlackRock did not request a historical performance dataset from the Group B Banks. Therefore none of the models were estimated using Group B Bank data. Instead, the loans held by Group B Banks were analysed using a model estimated based on Group A Bank historical information.

Small Business and Professional Loans (SBP)

4.1. Scope of Asset Quality Review

As of 30 June 2013, Small Business and Professional (SBP) loans totalled EUR 20.5 BN across Group A Banks and EUR 49 MM across Group B Banks. The purpose of the Asset Quality Review (AQR) was to provide an assessment of the assets held by each Bank and to gather qualitative information regarding the Banks' lending practices, portfolio monitoring, and workout procedures. BlackRock assessed SBP loan asset quality through the following processes:

- Conducted management due diligence sessions to review and discuss Bank history, product types, origination strategy, portfolio performance, loss mitigation practices, and collateral valuation and recovery efforts
- Reviewed loan-level and collateral-level portfolio data for Group A and Group B Banks, as of 30 June 2013. For Group A Banks, BlackRock also conducted an in-depth analysis of 5 year historical performance data, which was used to model probabilities of defaults
- Engaged EY to review a sample of SBP loans of the Group A Banks. The scope encompassed a review of the credit files and evaluating and grading origination practices, application of Bank policies, security and collateral adequacy, and an assessment of sustainable cash flow. EY also determined the performance status of each loan and compared it to the status assigned to the loan by the Bank. A total of 255 files were reviewed consisting of 200 loan files selected from Group A Parent Bank exposures and 55 loan files from entities that were recently acquired by the Group A Banks. This also includes the 120 SBP loan file reviews performed as part of the TAR exercise
- Findings from the drive-by valuations performed on residential properties and the desktop valuations of commercial real estate properties across the Group A Banks (see Section 2.4. and Section 5.4) were applied to real estate collateral of the SBP asset class
- Conducted research and consulted external sources in order to inform model projections and calibrate models, where necessary

These qualitative and quantitative factors served as inputs to inform BlackRock probability of default, exposure at default, and loss given default models developed to generate CLP results.

The due diligence process for Group A Banks included an original request for information (RFI) sent to each Bank prior to management due diligence sessions, loan-level data requests, and follow-up RFIs. The SBP Loan RFI covered the following main areas:

- Lender profile and organisational history
- General product features and portfolio stratifications
- Origination and underwriting strategies
- Credit review and monitoring processes
- Loan payment collection and servicing operations
- Loss mitigation strategies
- Historical performance
- Credit performance projections
- Collateral valuation and recovery practices, including valuation of personal guarantees
- Loan ratings models
- Status of any merger integrations, including effects on banking practices and data systems

Full-day due diligence sessions were held with management teams at each Group A Bank to cover all SBP loans, while one-day due diligence sessions were held to discuss both Retail and Commercial asset classes for the Group B Banks. In addition to the above listed RFI topics covered during management presentations, BlackRock also requested the following specific documentation to be submitted by each Group A and Group B Bank:

- Detailed loan-level data submission
- Product type descriptions
- Detailed summaries of the SBP loan portfolio by various risk metrics
- Schedule of historical payment status
- Loan underwriting and credit approval documentation
- Bank organisational structure for SBP loan underwriting, loan servicing, and payment collection department
- Description of specialised SBP loan products

When information was unclear or incomplete from the due diligence sessions or data submissions, BlackRock submitted written follow-up RFIs, exchanged emails with relevant Bank employees, and held follow-up calls, where necessary.

4.2. Portfolio Stratifications and Risk Analysis

Data Collection and Review

BlackRock developed a standardised loan-level data template tailored to Greek SBP loans, which included over 130 data fields covering, but not limited to, the following areas:

- Borrower characteristics – Unique identifier[25], physical or legal entity, industry classification, etc.
- Loan characteristics – Funded exposures, origination date, coupon structure, remaining term, secured flag, etc.
- Current and historical performance – Current and historical arrears status, loan modification status, etc.
- Collateral information – Collateral location, collateral type, origination appraisal, lien information, etc.

Upon receipt of Bank submissions, BlackRock downloaded and on-boarded the datasets to a database system, which facilitated the organisation and harmonisation of data across various output formats (i.e., .txt, .xls, etc.), enabling the creation of portfolio stratifications, data gap reports, and the implementation of data overrides and assumptions. The original data submissions by the Banks varied in the level of completeness, and over the course of several weeks, BlackRock and the Banks engaged in a comprehensive data reconciliation process.

BlackRock produced detailed stratification tables in a standard format and compared these tables to summary tables provided by each of the Banks to enable further corroboration of balances and other key risk factors. This process allowed the Banks to acknowledge that the data supplied to BlackRock was consistent with the Banks' own understanding of their respective portfolios. Inconsistencies were addressed via iterative data re-submissions, email correspondence, teleconferences, as well as in-person meetings. Reconciliations of differences were performed subject to materiality and to the extent practical, within the limited timeframe during which the analysis was conducted.

[25] For Banks that had recently acquired institutions (Alpha Bank, NBG and Piraeus), BlackRock requested a unique identifier covering the parent Bank and its acquired Banks

Data Assumptions

Following the data reconciliation process, some data deficiencies remained, the extent of which varied across Banks. Incomplete or inconsistent data necessitated, for modelling purposes, the application of practical working assumptions in order to complete the dataset. These working assumptions were informed by observations from the overall dataset, qualitative knowledge extracted from the AQR due diligence sessions, as well as BlackRock's judgment based on Greek-specific experience.

Figure 60: Selected Data Gap Assumptions

Field	Data Assumptions
Origination date missing	Assumed Bank's Weighted Average Seasoning Term
Maturity date missing	Assumed to be 30 June 2015 for Base Case analysis, and 30 June 2016 for Adverse Case analysis
Postal code is missing	Assigned to Geographic Location "Greece" category
Revolver Flag is missing	Assumed to be a Term Loan
Payment Type is missing	Assumed to be Interest Only
Current interest Rate missing	Assigned Bank's WA coupon
Interest rate type missing	Assigned to Floating
Guarantor Flag is missing	Assumed loan does not have any guarantors
Sole Proprietor Flag is missing	Assumed borrower business is a legal entity
Collateral Location missing	Assigned to Geographic Location "Greece" category
Most Recent Valuation Date missing	Assumed to be last valued at 30 June 2013[26]
Modification Flag missing	Assumed to not be Modified
State Guarantees collateral identified as missing from collateral file	Such collateral information was extracted from the exposure file where appropriate
Borrower Geographic location (based on Postal Code)	Assigned based on combination of available data in collateral and borrower data files (Athens, Thessaloniki, Other)

In addition to assumptions made to produce a more complete dataset, BlackRock also developed new fields through adjusting and supplementing Bank-provided data. These additional fields expanded the list of portfolio characteristics available to BlackRock for further analysis, and include the following:

[26] An exception is made for Cyprus Popular Bank where most recent valuation date was not available for all collateral. To account for this in the indexing of collateral value, BlackRock used the average index adjustment that was applied to Hellenic Bank and Bank of Cyprus

Figure 61: Selected Calculations Performed to Enhance Data Set

Calculations Performed	Calculation Method
Seasoning term	• For loans that have not been Modified difference between origination date and the analysis reference date of 30 June 2013, measured in months • For Modified loans, the difference between modification date and the analysis reference date of 30 June 2013, measured in months
Remaining term	• Calculated number of months between Maturity Date and analysis reference date of 30 June 2013, or; • Subtracted number of months since loan origination from loan term

Data Mapping and Standardisation

Despite universal field definitions, the degree of format variability for certain Bank responses within key fields necessitated the standardisation of those fields' contents in accordance with a BlackRock-developed mapping framework. This step was performed with consideration for the need to preserve data granularity.

Fields for which data mapping was required included Collateral Region, Collateral Type, Coupon Type and Delinquency Status. In these cases, BlackRock constructed a more concise range of labels/field contents, and based upon the original Bank responses, assigned existing line items to the labels within the smaller sub-set.

Portfolio Overview and Summary Statistics

The Group A Bank SBP universe encompassed EUR 20.5 BN of funded exposure across more than 540 K loans and 400 K borrowers. Eurobank and Alpha have the largest share of SBP exposures, with EUR 6.4 BN and EUR 5.6 BN in total funded balances, each representing approximately 31% and 27% of the total respectively. Piraeus follows closely with a EUR 4.8 BN funded balance (23% of the total), and NBG is the smallest constituent, with a EUR 3.7 BN funded balance, representing 18% of the universe.

Figure 62: Group A Banks SBP Universe

	Balance		Loan Count		Borrower Count	
	Loan Balance (EUR MM)	% of Total Balance	Loan Count (K)	% of Total Count	Borrower Count (K)	% of Total Count
Alpha	5,588	27.2%	127.9	23.6%	99.4	24.7%
Eurobank	6,434	31.4%	125.4	23.1%	94.1	23.4%
NBG	3,703	18.1%	101.2	18.7%	61.5	15.3%
Piraeus	4,791	23.4%	188.0	34.7%	148.4	36.8%
Total	**20,517**	**100.0%**	**542.5**	**100.0%**	**402.8**	**100.0%**

The table in Figure 63 below contains an overview of key characteristics and risk metrics of SBP exposure across the entire Group A Banks universe, side-by-side and relative to the Group A Bank average. It features key risk metrics such as performance status, loss mitigation, collateral coverage and loan characteristics.

Figure 63: Overview of Group A Bank SBP Portfolios

		Alpha	Eurobank	NBG	Piraeus	Group A Total	Group A Avg.
Portfolio Exposure	Funded (EUR MM)	5,588	6,434	3,703	4,791	20,517	
Performance Status	Current (0-89 DPD, %)	31	53	52	63		49
	Delinquent (90-359 DPD, %)	*8*	*11*	*10*	*11*		*10*
	Defaulted (360+ DPD, Denounced, %)	*62*	*36*	*38*	*26*		*41*
	360+ DPD (%)	*16*[5]	*5*	*8*	*7*		*8*
	Denounced (%)	*47*[5]	*31*	*30*	*18*		*32*
	Adjusted 90+ DPD[1] (%)	79	59	62	46		62
Loss Mitigation	Total Loss Mitigation	10	24	30	15		19
	Modified, Current (0-89 DPD, %)	*10*	*12*	*14*	*9*		*11*
	Modified, Delinquent (90+ DPD, Denounced %)	*1*	*13*	*16*	*6*		*8*
Security	Secured by Tangible Collateral (%)	65	78	70	83		74
	Capped Collateral Portfolio Coverage Ratio (%) [2]	53	64	59	76		63
	Capped Collateral Portfolio Coverage Ratio (Adj.; %)[3]	37	39	45	61		45
Loan Characteristics	Number of Borrowers (K)	99	94	62	148	403	
	Number of Loans (K)	128	125	101	188	543	
	Average Loan Size (EUR K)	44	51	37	25		38
	WA Coupon (%)	10	5	8	8		7
	WA Seasoning Term (Months)[4]	49	56	41	42		48
	Revolving (%)	47	26	20	37		33
	Government Guaranteed (%)	2	1	11	3		4

Note (1): Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been Modified
Note (2): Capped Collateral Portfolio Coverage Ratio is calculated by the ratio between (i) the sum of the rebased value of all tangible collateral (see Section 4.4), only including, for each borrower, an amount of collateral up to the Bank's exposure to that borrower and (ii) the total exposure of all of the loans in the portfolio. Capping recognises that a Bank can get no further benefit from collateral pledged by a borrower, beyond full payment of the obligations of that borrower.
Note (3): Capped Collateral Portfolio Coverage Ratio (Adj.) is calculated by the ratio between (i) the sum of the rebased and post-haircut value of all tangible collateral (see Section 4.4), only including, for each borrower, an amount of collateral up to the Bank's exposure to that borrower and (ii) the total exposure of all of the loans in the portfolio. Capping recognises that a Bank can get no further benefit from collateral pledged by a borrower, beyond full payment of the obligations of that borrower
Note (4): Seasoning term is defined as months since modification date for Modified loans and months since origination for non-Modified loans
Note (5): Due to lack of identifiers for denounced loans for Alpha Bank, loans in legal status are assumed as denounced

- The aggregate percentage of 90+ DPD and denounced balances across all Group A Banks was approximately 51%. The majority of the portfolio is comprised of term loans, with 33% of the portfolio being revolvers. Greek government guaranteed loans were limited representing less than 4% of the portfolio. The weighted average seasoning (adjusted for months since modification date for Modified loans) of SBP loans was 48 months
- Loans secured by tangible collateral represented 74% of the Group A Banks loan portfolios, with Piraeus having a larger part of its portfolio secured by tangible collateral at 83% compared to the other Group A Banks. The average capped collateral coverage ratio (as defined above) across the Group A Banks was 63%, with Piraeus having the highest coverage ratio of 76% and Alpha the lowest at 53%
- 41% of the Group A Banks SBP portfolio was greater than 360 DPD or denounced. Alpha had the highest portion of its portfolio at 360+ DPD or denounced at 62%, with a lower than average proportion in the 90-359 DPD category at 8%. 70% of Alpha's SBP portfolio is at 90+ DPD, which is significantly higher than the Group A Bank average of 51% while Piraeus was the lowest at 37%
- NBG has the largest percentage of loss mitigation performed to-date at 30%, followed by Eurobank (24%) and Piraeus (15%). As described in the Residential Mortgage stratifications section (see Section 2.2), there is some level of ambiguity regarding the extent Alpha has reflected and recorded the presence of loss mitigation on Modified exposures in the past, particularly for loans that are currently in legal status. As such, the loss mitigation metric, may be somewhat inconsistent for comparative purposes when considering Alpha
- The proportion of the Group A Banks portfolio classified as Adjusted 90+ DPD, as described above, was 62%, with Alpha being the highest at 79% and Piraeus the lowest at 46%

4.3. Loan File Reviews

SBP loan file reviews were based on small samples when compared to the total portfolio size and selected according to the sampling criteria below. Therefore, any quantitative or qualitative results derived by BlackRock should not be extrapolated to apply to the entire portfolio from which the sample was taken or to the respective Bank. Results should be interpreted as directional and indicative in nature only. They should also only be assessed in conjunction with the results from other qualitative and quantitative processes performed during the AQR process.

BlackRock engaged EY to review and assess a sample of 255 SBP borrower loan files selected by BlackRock to further inform on potential risk factors that could impact credit loss projections. The sample covered all Group A Bank portfolios across industry sectors and credit quality, including recently acquired entities for Alpha and Piraeus. The LFR process highlighted several key points with respect to the Greek SBP lending market. While these observations were not based on representative statistics, they provided directional insights into Greek SBP portfolios and current Bank practices to (i) sense check the data received from the Banks; (ii) inform qualitative modelling assumptions and adjustments; and (iii) better understand and explain quantitative modelling output.

Scope

The purpose of the loan file reviews was to complement the findings from the above-mentioned due diligence process (via due diligence sessions, site visits and documentation review), in particular:

- Determine appropriateness of Banks' internal loan status assessment
- Review security and lien position of collaterals
- Develop a view on Bank origination, credit sanctioning and portfolio management practices (e.g., rescheduling or other activity)

To achieve this, EY reviewed the credit file source documentation including the loan application, the company financials, the guarantor and shareholder information, collateral valuation reports, as well as the Bank's internal calculations and notes. The Banks made credit officers available to discuss key questions and initial observations. Based on the information, EY completed a review template, developed in conjunction with BlackRock, for each loan (see Section 8.3).

Sampling Process

The sample was selected according to risk-based criteria targeting specific balance, delinquency and status metrics as described below:

Figure 64: SBP LFR Selection Criteria Targets

Criteria	Target
Balance Size	• 40% with funded balances less than EUR 150 K • 45% with funded balances between EUR 150 and EUR 500 K • 15% with funded balances greater than EUR 500 K
Troubled Asset Status (either 90+ DPD, or Modified)	• 60% of Troubled Assets • 40% of Non-Troubled Assets
Delinquency Status	• 30% that are Current • 20% that are 1-89 DPD • 15% that are 90-180 DPD • 15% that are180-360 DPD • 20% that are 360+ DPD

Criteria	Target
Location	• 100% in Attica / Athens area, inclusive of suburbs (for practical reasons)
Entity Type	• 50% legal entities • 50% physical entities
Collateralisation	• 60% flagged as secured by Banks
Origination	• 20% originated in 2012 or 2013
Legal Status	• 14% of loans in Legal status

For the recently acquired entities, the samples were selected to have attributes approximately in line with their individual portfolio characteristics.

The total reviewed sample consisted of 255 borrower relationships encompassing 465 loan facilities with an aggregate exposure of EUR 46.4 MM. It comprised 50 SBP borrowers from each Group A Parent Bank, 20 SBP borrowers from Emporiki, 20 SBP borrowers from ATE, 5 SBP borrowers from Geniki, 4 SBP borrowers from Cyprus Popular Bank, 4 SBP borrowers from Bank of Cyprus and 2 SBP borrowers from Hellenic Bank entities. The size of the samples selected from recently acquired entities was a function of respective portfolio size relative to the Group A Parent Banks.

Figure 65: SBP LFR Sample

Bank	# Borrowers	# Facilities	Exposure (EUR MM)	Count Default / Impaired (Bank Classification)
Parent Entities				
Alpha Bank	50	84	9	36%
EFG Eurobank	50	98	12	42%
National Bank of Greece	50	130	12	44%
Piraeus	50	76	11	46%
Recently Acquired Entities				
ATE (Piraeus)	20	24	0	25%
Bank of Cyprus (Piraeus)	4	5	0	50%
Cyprus Popular Bank (Piraeus)	4	4	0	25%
Emporiki (Alpha)	20	33	1	60%
Geniki (Piraeus)	5	7	0	100%
Hellenic (Piraeus)	2	4	0	50%
Total	***255***	***465***	***46***	***43%***

Loan File Review – Key Findings

The loan file reviews process highlighted several key points with respect to the Greek SBP lending market and provided helpful directional insights into (i) current Bank practices and (ii) current distressed market conditions of the Greek SBP borrower segment.

Loan Current Status

Across the sample, 24 of the 76 loans (32%) rated Performing by Banks had been rated Watchlist by BlackRock/EY. BlackRock/EY also rated 123 loan files (48%) as Defaulted or Impaired compared to 110 files (43%) by the Banks. This divergence reflected both (i) different credit assessments of the loans by BlackRock/EY and the Bank's credit monitoring departments and, potentially, (ii) continuously deteriorating economic conditions during the 4-month period between the 30 June 2013 Reference Date and October 2013 when the BlackRock/EY file reviews took place.

Out of a sample of 69 loans rated as Watchlist, by the Banks, BlackRock/EY rated 4 loan files (6%) as

Performing. BlackRock/EY assessment was due to the borrowers not being in arrears and, in some of the cases, having never missed a payment installment. BlackRock/EY noted that a Bank Watchlist rating was technically assigned due to specific minor triggers such as (i) request for proactive rescheduling despite a strong financial situation, or (ii) late payment of minimal overdue expenses/charges, amongst others, which do not accurately reflect the borrower's performance status.

Figure 66: BlackRock/EY Current Status Assessment vs. Banks Current Status

	BlackRock / EY Current Status				
Bank Current Status	**Performing (%)**	**Watchlist (%)**	**Default and Impaired (%)**	**Files (#)**	**Files (%)**
Performing (%)	67	32	1	76	30
Watchlist (%)	6	77	17	69	27
Default and Impaired (%)	0	0	100	110	43
Total Sample (%)	***22***	***30***	***48***	***255***	***100***

Loan File Quality

The LFR process also showed that 52 loan files (20%) in the sample were incomplete, 170 loan files (67%) were adequate, and 33 files (13%) were in good order.

During due-diligence meetings, Banks stated to BlackRock that financial information for 2012, such as tax forms, may be incomplete due to the timing of the credit-review cycle, which occurs every 9-months, or 12-months, depending on specific Bank practices and the performance status of the borrower. Furthermore, 2012 year-end financials for Accounting Book Category C entities may not yet have been finalised at the time of the review.

Figure 67: Loan File Quality Summary

Loan File Quality Summary		
Metric	**# of Files**	**% of Files**
Loan files assessed "in good order"	33	13%
Loan files assessed "adequate"	170	67%
Loan files assessed "incomplete"	52	20%
Total	***255***	***100%***

Note (1): In Good Order: Important documentation (loan agreement and term sheet with key terms signed by the client, client identification documents, credit approval documents, recent financial information, Teiresias Credit Checks, collateral documentation, documents related to rescheduling/restructuring, etc.) is included and up to date;
Note (2): Adequate: Important documentation is included but omissions exist (information is out-dated, credit checks are not evidenced, tax return of the key shareholder is missing, etc.);
Note (3): Incomplete: Significant omissions exist (loan agreement, term sheet, collateral, etc.)

Loan Modification Status Summary

BlackRock/EY found that 99 loans were Modified, compared to 77 shown as Modified by the Bank (i.e., BlackRock/EY identified that there were 22 loans that were listed as non-Modified in Bank's loan-level data submission file, but were shown as Modified in the paper loan file).

Figure 68: BlackRock/EY Level of Modifications vs. Bank Reported Level of Modification

Loan Modification Status Summary	Banks		BlackRock/EY		Difference (BlackRock/EY - Banks)	
Metric	# of Loans	% of Loans	# of loans	% of Loans	# of Loans	% of Loans
Modified	77	30%	99	39%	22	9%
Non-Modified	178	70%	156	61%	-22	-9%
Mod in tape and non-mod in file	-	-	0	0%	-	-
Non-mod in tape and mod in file	-	-	22	9%	-	-
Total	***255***	***100***	***255***	***100%***		

Credit Performance Summary

Across the entire sample, BlackRock/EY found that 102 loans were Current compared to 108 as reported by the Banks. BlackRock/EY also found that of the loans that were Modified, 18 loans are 1-90 DPD as of the 30 June 2013 Reference Date (compared to 17 as reported by the Banks) and 37 loans are 90+ DPD (compared to 36) as reported by the Banks.

Figure 69: Credit Performance Summary

Credit Performance Summary	Banks		BlackRock/EY		Difference (BlackRock/EY - Banks)	
Metric	# of Files	% of Files	# of Files	% of Files	# of Files	% of Files
Current	108	42%	102	40%	-6	-2%
1-90 dpd modified	17	7%	18	7%	1	0%
1-90 dpd non-modified	21	8%	23	9%	2	1%
90+ dpd modified	36	14%	37	15%	1	0%
90+ dpd non-modified	33	13%	35	14%	2	1%
Legal Status	40	16%	40	16%	0	0%
Total	***255***	***100%***	***255***	***100%***		

Portfolio Management Summary

Banks have, in general, been engaged in restructuring and rescheduling activity. In some cases, multiple modifications were performed. Across the sample, 14 loans (5%) have undergone more than 3 restructurings, as found by BlackRock/EY. The LFR process identified that the Banks have sought additional collateral for 27% of loans out of the entire sample, of which 30% has been Modified according to the Banks.

Figure 70: Portfolio Management Summary

Portfolio Management Summary		
Metric	# of Files	% of Files
Loans with 3+ Restructurings	14	5%
Additional Collateral Sought (Yes)	70	27%
Total	***255***	***100%***

Borrower Financial Situation Summary

Loan file reviews indicated that 188 of the facilities reviewed (74%) were used to finance working capital. In general, borrowers had, in most cases, drawn their facilities more heavily as a result of the stressed economic environment. Banks have mostly aimed to reduce borrower limits where possible and Modified revolving facilities to term loans for troubled borrowers.

Out of 69 borrowers rated Watchlist by the Banks, 21 borrowers (30%) in this group were assessed as weak. A further 12 out of 76 borrowers (16%) rated Performing by the Banks were assessed to be weak. These

statistics highlight the risk of currently non-defaulted borrowers migrating into default in the near term.

Figure 71: Borrower Financial Situation Summary

Borrower Financial Situation Summary		
Metric	**# of Files**	**% of Files**
Financial status of borrower assessed "weak" by BlackRock / E&Y		
Watchlist	21 / 69	30%
Performing	12 / 76	16%
Primary loan purpose working capital financing	188 / 255	74%

Note (1): Weak is a qualitative field based on a set of criteria such as financial data trends and magnitude, Black Teiresias flag, main Shareholder's or guarantor's creditworthiness, loan exposure and tangible collaterals.

Collateral Summary

The LFR confirmed that the majority of SBP loans was secured across a broad array of collateral types, including commercial real estate, residential real estate, land, inventory and receivables. In addition, 231 borrowers in the sample (91%) provided a personal guarantee to the Banks. This is in line with findings from AQR due-diligence meetings where the Banks stated that a significantly percentage of SBP loans had personal recourse to the SBP business owner.

Banks have also stated during due diligence meetings that the threat of enforcement of personal guarantees is used in borrower negotiations to achieve forced or voluntary pre-notations of additional real estate collateral. In the case where the guarantor is also the borrower, it can be difficult to establish whether the majority of the borrower's assets are already securing the Bank's facilities. Recoveries and the incentive to pay increases when third party guarantors are involved. However, third party guarantors are not a prevalent point of recourse for the Banks. As such, despite some evidence from the Banks that additional collateral has been identified and/or provided by borrowers in certain instances, it is challenging to determine the value of such personal guarantees at the portfolio level.

BlackRock/EY determined that for 127 borrowers (50%), the collateral was material relative to the exposure file, whereby value of the collateral (in terms of market value) over total exposure is 80% or more of the total exposure.

Figure 72: Collateral Summary

Collateral Summary		
Metric	**# of Files**	**% of Files**
Secured facilities	184	72%
Facilities with real estate & land collateral	149	58%
Borrowers providing personal guarantees	231	91%
Material collateral relative to exposure	127	50%
Total	***255***	***100%***

Note (1)**: Material collateral relative to exposure** refers to when the value of the collateral (in terms of market value) over total exposure is 80% or more of the total exposure

4.4. Modelling Methodology

4.4.1. General Approach

Similar to the approach used for other Retail asset classes, BlackRock's SBP methodology employed a suite of econometric behavioural models calibrated to Greek economic factors and Greek loan portfolio data.

In formulating credit loss projections for the Group A SBP loans, BlackRock's SBP model employed both quantitative and qualitative approaches to derive the projected probability of default ("PD"), exposure at default ("EAD") and loss-given-default ("LGD") to estimate credit loss projections ("CLP") over time, calculated as follows:

Figure 73: Credit Loss Formula

Credit Loss = PD x EAD x LGD

Where:

- **"PD" - Probability of Default**: Likelihood that a given loan exposure will roll into a state of default at any given time. Default occurs once a delinquent exposure reaches 360 DPD or is denounced and is modeled via a transition matrix model described further below
- **"EAD" - Exposure at Default**: Loan balance at the time of default. EAD is a function of the contractual amortisation profile of the SBP loan. In addition, BlackRock projected changes in balances for loans without contractual amortisation (such as revolving credit facilities) as well as any prepayments and/ or cures that occur before or after default
- **"LGD" - Loss Given Default**: Portion of a defaulted loan balance which is not recovered by the lender. This is defined as the difference between the loan amount and the recovery proceeds at the projected time of recovery through either settlement with the borrower or collateral liquidation, and takes into account, among other things, transaction costs such as brokerage and legal expenses, auction discounts as well as other miscellaneous expenditures

BlackRock utilised a bottom-up approach which commenced with the collection of cross-sectional data for relevant exposures, stratification of these exposures, and analysis of historical loan performance over time to identify risk drivers, broad patterns and fundamental loan characteristics with predictive capabilities.

BlackRock requested and received loan-level and collateral-level data files from each of the Group A Banks, capturing snapshots of the portfolio as of 30 June 2013 and five years of history of loan delinquency status. BlackRock adopted a quarterly transition matrix model approach where, at each point in time, loan status is classified into 5 performance buckets: Current, Prepaid, Delinquent, Defaulted, and Liquidated. The PD model projects the likelihood of moving between these states and is based on a cross-sectional regression-based statistical analysis that derived model coefficients for those macroeconomic, borrower-specific and loan-specific attributes with the greatest predictive power

SBP lending in Greece benefits from considerable levels of collateralisation, with typical collateral including, but not limited to, residential property, commercial property, receivables, securities, cash, post-dated cheques and guarantees. For the LGD analysis, BlackRock on-boarded, reconciled and allocated collateral from the collateral data file submissions to each Group A Banks' relevant loan and borrower exposures from the loan data file submissions via available unique identifiers and data due diligence. Real estate collateral valuations were subsequently rebased to 30 June 2013 market values and subject to drive-by adjustments for residential real estate assets and desktop collateral valuation adjustments for commercial real estate assets. Furthermore, BlackRock applied forward value curves to the rebased and adjusted real estate-related collateral values to account for projected future changes to market valuations. Real estate and non-real estate collateral was subsequently subject to valuation adjustments in line with BlackRock's collateral valuation methodology (for further details see Section 4.4.2., Step 4).

4.4.2. CLP Modelling Approach

The diagram below is a high-level overview of the model-related steps employed by BlackRock to generate the credit loss projections for SBP loans.

Figure 74: SBP Loans General Credit Loss Projections (CLP) Approach

Further detail on each step is outlined below:

Step 1 of 7: Data Collection and Reconciliation

Cross-sectional Data

The SBP sub-asset class encompasses all loans to small businesses and/or professionals, inclusive of leasing and factoring loans[27]. BlackRock requested that the Banks identify, collect, and submit aggregate (and granular) statistics relating to these exposures (e.g., total balances, exposures size, geographic spread, vintage distribution, collateral information, etc.).

BlackRock also requested that Banks submit granular data via a standardised template containing fields with common key term definitions, to mitigate any confusion and pre-empt inconsistencies resulting from the differing data frameworks and nomenclatures employed across the Banks. This cross sectional data, reflecting exposures as of the analysis date, 30 June 2013, included:

- Borrower characteristics – Unique identifier[28], physical vs. legal entity, industry classification, etc.
- Loan characteristics – Funded exposures, origination date, coupon structure, remaining term, secured flag, etc.
- Performance - Current arrears status and recent history, loan modification history, etc.
- Collateral information – Collateral location, collateral type, origination appraisal, lien information, etc.

Historical Data

BlackRock complemented this cross-sectional data with subsets of historical data to capture dynamic credit performance over time, including the following:

- Bank-specific delinquency data: 5 year historical time series, showing the delinquency profile of Group A Banks' SBP exposures at quarterly intervals. Historical data provided by NBG and Alpha was

[27] During the Asset Quality Review, BlackRock discussed with each Group A Bank existing exposures in their non-bank subsidiaries, specifically the leasing and factoring businesses, and included these exposures as part of the SBP CLP exercise. Leasing and factoring portfolios were identified at Eurobank, NBG and Piraeus with an aggregate current funded exposure of EUR 0.2 BN (1.1% of the total Group A SBP exposure)

[28] For Banks that had recently acquired institutions (Alpha Bank, NBG and Piraeus), BlackRock requested a unique identifier covering the Parent Bank and the acquired entities

excluded from the PD estimation analysis due to (i) lack of historical data on denounced loans and (ii) lack of historical data provided on a quarterly basis, respectively. As such, BlackRock's SBP model was based on statistical relationships inferred by historical performance data from the Eurobank and Piraeus Parent Bank portfolios, which collectively comprise 40% of the Group A Banks SBP universe.

- Bank-specific loan payment history: payment history for exposures which had been fully paid down over the 5 year historical time period, ending 30 June 2013; BlackRock received relevant data from Piraeus Parent Bank which was used to inform both BlackRock's projections for prepayments, and to further supplement available data that inform the transition probabilities equations.

BlackRock performed a verification of cross sectional and historical data by comparing it against various other sources, such as supervisory reports provided by the Bank of Greece, Bank presentations, the Banks' various audited and unaudited financial statements, as well as data previously submitted for the 2011 Diagnostic. This was an iterative and interactive process between BlackRock and the Banks, whereby any errors in Bank submissions, as well as potential inconsistencies therein were communicated to the Banks and subsequently addressed through clarifying communication and appropriate reconciliations where necessary.

Segregation of Loan Modification Data

Banks have engaged in short- to medium-term modifications in order to accommodate current borrower financial difficulties by reducing payment instalments to a more affordable level for the borrower, at least in the short term. These modifications, which include restructurings and rescheduling are typically accompanied by re-classifications of loan status from their respective states of delinquency to "Current". As a result, loan modification activity has the potential of distorting the observations of true historical loan transitions, by overstating the number of transitions from Delinquent to Current. Given that such modification-driven transitions do not represent natural cures, modification activities may obscure the statistical relationship between exposure-specific/macroeconomic variables and fundamental loan performance. As such, historical loan transitions occurring at or prior to observed modification dates were not included in the PD estimation.

BlackRock performed an analysis of the historical dataset and concluded that Modified loans in the Current state are more likely to become Delinquent than non-Modified loans. Transitions from Current to Delinquent states are modelled separately for Modified and non-Modified loans

Step 2 of 7: PD Model Construction and Calibration

BlackRock developed the Greek SBP Loans model using a transition matrix framework, whereby the projected loss for any specific exposure is estimated by first taking into account the probability that the given exposure becomes delinquent, followed by default, and upon the point of liquidation, experiences a loss severity on the outstanding balance owed. Furthermore, the model computed this outstanding balance as a function of contractual amortisation through periodic instalments, as well as any potential prepayments.

For modelling purposes, active SBP loans are classified into one of three initial states: "Current", "Delinquent", or "Default", which is determined by the initial arrears (DPD) status, standardised across the Banks, as shown in the Figure below. In addition to potential transitioning between these three initial states, Current, Delinquent and Default, loans may also become liquidated, prepaid or amortised according to schedule. Liquidation occurs upon the sale of underlying collateral, while full prepayment results from the redemption of the outstanding loan balance.

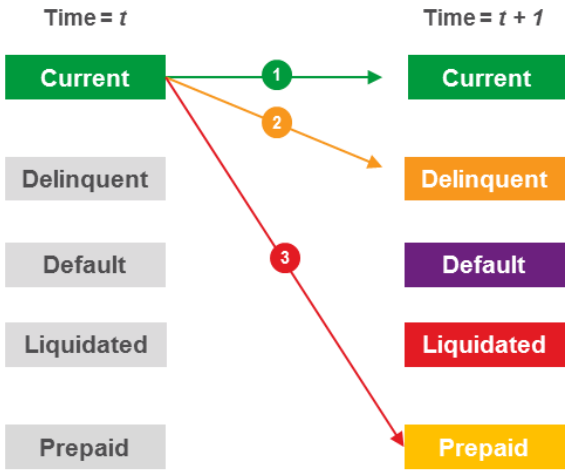
Figure 75: SBP Loans - Model loan state definitions

Model Loan State	BlackRock Model Definition
Current	• 0 – 89 DPD
Delinquent	• 90 – 359 DPD
Default	• 360+ DPD or loans in Legal or that have been denounced
Prepaid	• Loan state for exposures that have been prepaid • The transition from Current and Delinquent loans to Prepaid is based upon historical data provided by Piraeus Bank
Liquidated	• Loan state for exposures that have been liquidated • BlackRock assumes only Defaulted loans will liquidate • BlackRock assumes a fixed proportion of defaulted loans liquidating each period, ramping up from 0% to 5% per quarter between 31 December 2013 and 31 December 2015 in Base Case and between 31 December 2013 and 31 December 2016 in Adverse Case

Note: In addition to these loan states above, loans may pay down according to their contractual payment schedules, and therefore become fully amortised.

The likelihood of moving from one of these states to another is a function of several factors including, but not limited to, loan, borrower, and collateral characteristics. External factors, such as GDP Growth, also drive credit performance. For instance, the possible transitions which may occur to a loan in Current status at Time t are illustrated below.

Figure 76: Single-period transition possibilities for a Current loan in the SBP Loans model



A loan which is Current at time *t* (i.e., between 0 and 89 DPD) may transition into the following states:

1. Stay Current, through payment of the necessary monthly instalment amounts, or;
2. Become Delinquent (defined as 90 to 359 DPD) due to missed payments, or;
3. Become fully paid down ("prepaid"), in which case, the borrower has chosen to satisfy the total balance of the loan by paying all amounts owed

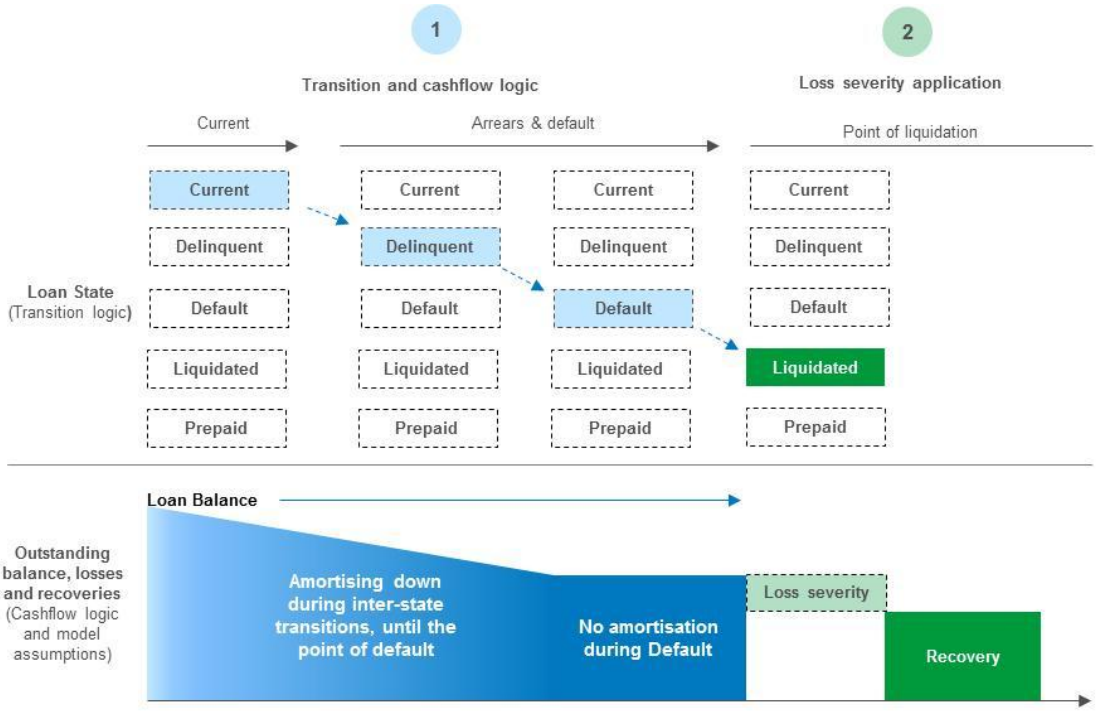
Transitions from Current to Default are assumed to be 0 at all times in the SBP model

Additionally, between *t* and *t+1*, other exposures in the other loan states such as Delinquent and Default, may experience their own transitions, driven by exposure-specific factors and external variables

The quarterly transition matrices used to project the likelihood of loans moving between these states (as informed by the statistical relationships and risk drivers) were combined with a cashflow logic that employs

periodic amortisation to determine outstanding loan balances at various points in time. The framework is illustrated in the Figure below.

Figure 77: Credit loss framework within the SBP loan model



Note: Diagram above demonstrates a simplified 3-step transition for a Current loan at time *t*=0. Actual inter-state model transitions may be more complex

Quarterly transitions between loan states are assembled in a time-varying matrix like the one illustrated in the Figure below, where the transitions implemented as probabilities calculated by formulae estimated from a regression are denoted in bold. Each row of the matrix must sum to one, and each element of the matrix not equal to 0 or 1 is a function of the loan-specific characteristics (both static and dynamic) and external variables. For instance $P_{cd}(x_{it})$ is the probability that loan "i" with characteristics "x" at time "t" will transition from Current to Delinquent. The set of factors "x" will also generally include macroeconomic factors.

Figure 78: Transition Matrix Modelling

		Time = t+1				
		Current	Delinquent	Default	Prepaid	Liquidated
Time = t	Current	$P_{cc}(x_{it})$	$\mathbf{P_{cd}(x_{it})}$	*0*	$P_{cp}(x_{it})$	0
	Delinquent	$\mathbf{P_{dc}(x_{it})}$	$P_{dd}(x_{it})$	$\mathbf{P_{df}(x_{it})}$	$P_{dp}(x_{it})$	0
	Default	*0*	$\mathbf{P_{fd}(x_{it})}$	$P_{ff}(x_{it})$	0	$P_{fl}(x_{it})$
	Prepaid	0	0	0	1	0
	Liquidated	0	0	0	0	1

Below is a list of explanatory variables and relevant intercepts employed by BlackRock's SBP model to predict quarterly Current to Delinquent transitions for non-Modified SBP loans, as well as some general context describing how these factors impact projected credit performance. This figure below ranks the variables within the BlackRock SBP transition matrix model in order of statistical significance. This indicates the level of confidence that the factor is a significant driver of performance and thus be included in the model. This does not indicate at all how important each of the factors are for explaining variation either over time or between

portfolios for the Credit Loss Projections.

A full list of the suite of explanatory variables employed by BlackRock's SBP loan model is included in Appendix – Retail.

Figure 79: SBP model explanatory variables and intercepts for Current to Delinquent (Non-Modified) and Current to Delinquent (Modified) transitions

Prob(Current->Delinquent) Non-Modified loans	Factor Rank[1]	Direction of Correlation	Chi-Sqr Statistic[2]	Significance
ln(Loan Age)	1	+	1,760.7	1%
Δ Unemployment	2	+	1,018.8	1%
Δ GDP	3	-	503.4	1%
Payment Type	A	-	7,923.2	1%
Physical Borrower	B	+	1,572.5	1%
Revolving Loan	C	+	1,456.8	1%
Business Sector	D	dependent on category	339.9	1%
Government Guarantee Flag	E	-	86.1	1%

Prob(Current->Delinquent) Modified loans	Factor Rank[1]	Direction of Correlation	Chi-Sqr Statistic[2]	Significance
ln(Loan Age)	1	+	3,424.2	1%
Loan Age	2	-	1,482.8	1%
Δ Unemployment	3	+	314.4	1%
Loan Coupon	4	+	62.0	1%
Δ GDP	5	-	53.7	1%
Guarantor Flag	A	+	822.0	1%
Government Guarantee Flag	B	-	243.3	1%
Revolving Loan	C	+	175.5	1%
Payment Type	D	-	124.9	1%
Business Sector	E	dependent on category	99.8	1%
Region Islands	F	-	33.9	1%
Physical Borrower	G	+	32.2	1%

Note (1) Continuous Rank = 1, 2, 3, 4… Categorical Rank= A, B, C, D…
Note (2) For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the individual effects is reported, representing a lower bound of the joint significance of the combined categories.

The most important variables in explaining the probability of default (PD) for the SBP asset class model are (a) the current status of the loan, (b) the modification status and, (c) the macroeconomic variables.

- Modification flags: Borrowers who have experienced a temporary or permanent reduction in their capacity to service their payments are commonly offered a modification to their loan terms by their lender. In order for these to be considered sustainable, the amended terms should represent an affordable solution for the borrower and its business. Difficulties arise when Banks provide short-term solutions to borrowers with permanently diminished payment capacity, which results in high re-default rates. The modification flag has had a notable negative effect on performance, increasing the probability of rolling to more severe delinquency stages as well as decreasing the chance of curing from worse performing states

- Unemployment: Change in unemployment is another relevant measure of current economic conditions, as it can result in a decline in domestic demand and thereby affects the performance of SBP loans. As shown in the tables above, BlackRock observed a positive correlation between change in unemployment levels and transition probabilities into worse performing states

- GDP: BlackRock found the change in the level of economic activity as measured by Real GDP is a strong factor in explaining the performance of SBP loans across all delinquency buckets. BlackRock used the 4-quarter moving average of the quarterly growth rate of Real GDP to smooth seasonality

effects. GDP growth has a positive effect on curing transitions and a negative effect on transitions to worse performing states

- Seasoning (or Loan Age): Defined as the amount of time that the loan has been outstanding. Seasoning is a significant factor in all of the models. Unlike the other factors listed here, the correlation between seasoning and each of the performance measures changes through time and presents a hump-shaped seasoning vs. default curve, where the probability of moving into worse performance states is lower for loans with the lowest and highest loan ages. This may be due to a series of factors, including different coupon types at origination and diminishing propensity to become delinquent as the loan seasons. For Modified loans, seasoning represents the time that the loan has been outstanding since the last modification date
- Guarantor indicator: This flag indicated whether a guarantor was requested by the lender in addition to the main borrower to provide additional guarantees for the final repayment of the loan. BlackRock found a positive correlation between the transition from Current to Delinquent for Modified loans with guarantors, which may signal that the guarantor was required by a lender when modifying the loan as a consequence of the weak performance of the borrower
- Government guaranteed indicator: Government guaranteed loans typically have more favourable terms than standard loans. This was reflected in the general positive results on performance observed throughout the transition probabilities, having a negative effect on transitions to worse performing states and a positive one on curing transitions
- Industry sector indicators: BlackRock tested the impact of a set of industry sector indicators on the transition probabilities and found an overall statistically significant impact for Agriculture, Construction, Manufacturing, Service, and Trade, as shown above
- Payment Type: Indicated whether a loan is Interest Only rather than amortising. BlackRock found this factor to be statistically significant in explaining early transitions, with a negative correlation between the transitions from Current to Delinquent states, and with a positive correlation for cures back from Delinquent to Current state
- Revolving loan indicator: Indicated a revolving financing facility. BlackRock found this factor to increase the probability of moving from Current to Delinquent state, while having an opposite effect on the transition from Delinquent to Current state
- Current loan coupon: Current coupon/interest rate (level) paid by a borrower on an SBP loan. High interest rates generally reduce loan affordability, and increase the likelihood of a decline in borrower credit performance. Additionally, the interest rate level at the time of origination may be considered a key credit risk indicator, as lenders typically charge higher interest rates to riskier borrowers at origination
- Physical borrower indicator: Indicated whether the SBP business was a physical entity rather than a legal entity. BlackRock found this factor to be statistically significant with a positive correlation between the transitions from Current to Delinquent states, and with a negative correlation for cures back from Delinquent to Current state

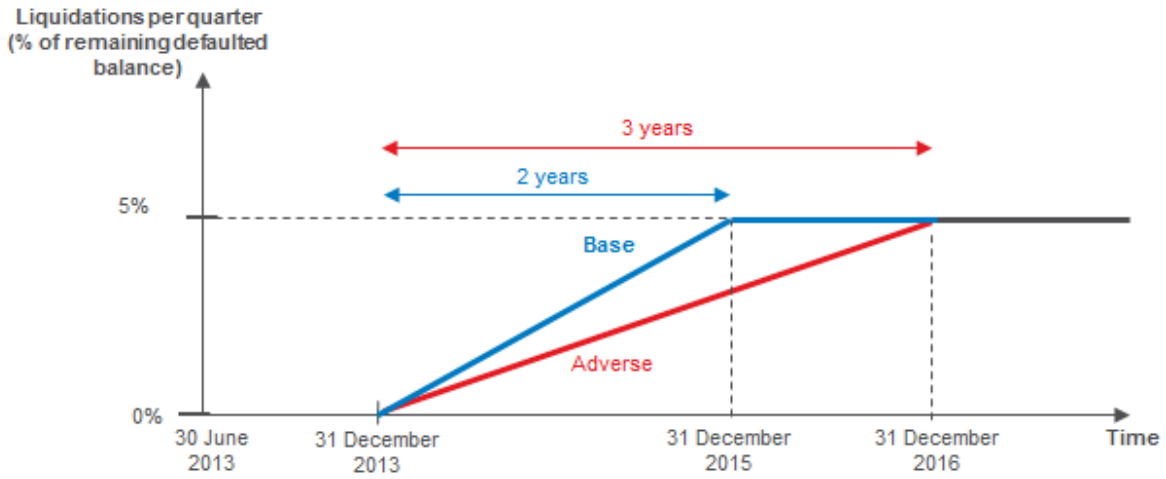
Current to Prepay / Delinquent to Prepay

Current loans and delinquent loans were assumed to prepay 0.125% of the outstanding loan balance per quarter. This assumption was made based on historical loan payment data provided for the Piraeus Parent Bank portfolio for loans that have paid off with no loss more than three months prior to their scheduled maturity date.

Default to Liquidation

The BlackRock SBP model assumes that liquidations commence on January 1, 2014. The speed of liquidations gradually ramps up to a steady state of 5% of the initial defaulted balance per quarter, which equates to a 5-year work out period. Specifically, it ramps up from 0% to the steady state speed of 5% per quarter over 2 years in the Base Case, and over 3 years in the Adverse Case. These assumptions are aligned with similar roll to liquidation assumptions made in the Residential asset class (see Section 2.5 for further details).

Figure 80: Liquidation Ramp-up Across Base and Adverse for SBP model



By assuming a gradual increase, model projections were independent of any biases that may have otherwise arisen from liquidations being concentrated within one single period in time. The relatively slower rate also aimed to account for the current illiquid market conditions and the potential capacity/procedural constraints and backlogs at the responsible courts which may affect the actual rate of liquidation.

Step 3 of 7: EAD Model Assumption-Setting

Key assumptions are listed below and are based on observed historical data, specific market intelligence and Bank management discussions.

Unfunded Draw Assumptions

In determining the EAD for SBP loans, BlackRock considered the funded, unfunded committed and unfunded uncommitted exposures and the likelihood of future draws on existing Bank commitments in the loan portfolio.

Unfunded Committed Balances are defined as unfunded exposures where the Bank has a contractual commitment to provide funds upon request of the borrower. Unfunded Uncommitted Balances are defined as exposures where disbursement of funds is at the discretion of the Bank.

The BlackRock SBP model assumes the borrower draws 10% of the unfunded committed balance and 5% of the unfunded uncommitted balance. As such, the EAD, as of 30 June 2013, for each loan is calculated as follows:

EAD = 100% of the Current Funded Balance
+ 10% of the Unfunded Committed Balance
+ 5% of the Unfunded Uncommitted Balance

In addition, if an exposure was delinquent on the cut-off date, it was assumed that there would be no further draws on the unfunded balances.

Separately, borrowers with zero or negative current funded exposures were excluded from the CLP exercise. Negative balances can arise in various ways, such as the Bank financing receivables at a discount, and the receivables eventually being paid in full, and the Bank holding the excess amount as credit for the borrower.

Repayment and Amortisation Assumptions

For each time period after 30 June 2013, the BlackRock SBP model calculated a projected outstanding loan balance (inclusive of assumed drawn unfunded exposures).

For revolving loans and loans with a maturity date prior to 30 June 2015, the maturity is assumed to occur on 30 June 2015 in the Base Case and 30 June 2016 in the Adverse Case.

For amortising loans, BlackRock assumed a principal payment schedule that amortises the loan by the maturity date

- Current loans were assumed to make all of their scheduled payments
- Delinquent loans, prior to their maturity date, were assumed to amortise at 25% of their assumed scheduled instalment in the Base Case[29] and 15% in the Adverse Case

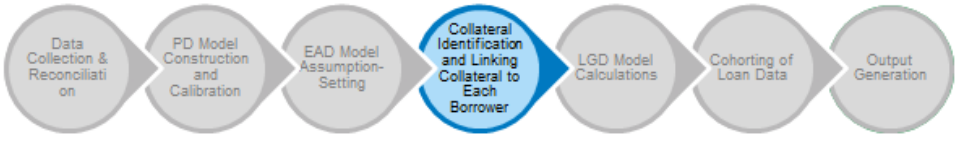
For interest-only loans, BlackRock assumed that the current outstanding balance is due to be repaid at the loan maturity as a bullet payment.

- Current loans were assumed to make the bullet payment at loan maturity in full
- Delinquent loans are assumed to repay 15% and 10% of the bullet payment at loan maturity in the Base Case and Adverse Case respectively.

Subsequent to the loan maturity date, any remaining balance are assumed to be delinquent and extended for an additional 3 months with, partial payments being made as specified above. The loan continues to extend in three month intervals until the loan balance is either repaid or transitioned to a different state.

Current and delinquent loans are assumed to prepay 0.125% of the outstanding balance each quarter as described above.

Step 4 of 7: Collateral Identification, Classification and Linking Collateral to Each Borrower



BlackRock's loan recovery analysis primarily focused on tangible collateral, such as real estate, receivables, cash and cash-like financial instruments, which could be liquidated following a borrower event of default. The

[29] Informed by arrears balance transition data provided by Eurobank

modelling approach for the BlackRock SBP model was broadly similar to the Corporate methodology.

The following section describes the process for collateral classification, valuation and linking of collateral data with the borrower's loan data as well a brief overview of the relevant assumptions relating to guarantees and unsecured exposures. Please refer to the Corporate Section for additional details on the overall approach utilised for collateral identification, classification and LGD calculations (see Section 5.4).

Identification and Classification of Collateral

The Group A Banks total gross collateral value based on Bank valuations including guarantees (where information was provided on collateral-level data file submissions) amounted to EUR 59.3 BN as of the Reference Date of which EUR 33.7 BN was tangible collateral.

As part of the data reconciliation process, BlackRock confirmed total aggregate collateral values by collateral type with each Group A Bank.

As depicted in **Error! Reference source not found.** below, BlackRock mapped available collateral data for BP Loans to distinct collateral type categories to ensure consistency and comparability across the Group A Banks. BlackRock also identified whether real estate collateral pledged was on a first lien or non-first lien basis to account for the seniority status of such liens in a liquidation scenario.

Rebasing of Collateral Values

BlackRock rebased Bank-reported real estate collateral values to assumed market levels as of the Reference Date as follows:

- For residential real estate, valuations were rebased, as described in the Residential Property Drive-by overview (Section 2.4.), by first (i) indexing to the quarterly national series of the Bank of Greece House Price Index ("HPI") and subsequently (ii) applying a residential drive-by adjustment
- For commercial real estate properties, a similar approach to the above was taken whereby property valuations were first (i) indexed to a representative national historical value series and subsequently (ii) adjusted based on observed differences between indexed valuations and vendor provided desktop valuations on a sample of properties

Specifically, BlackRock's SBP model leveraged findings from a market report commissioned from Cushman & Wakefield ("CW") and NAI Hellas to perform a desktop valuation of a sample of 406 properties, of which over 80 properties related to SBP loans. BlackRock found that for collateral valuations where the property was last valued in 2011 or earlier, the vendor valuation for such property in general exceeded the indexed Bank valuation. This suggested the use of national commercial real estate indices may overstate the reduction in market value for SBP commercial real estate properties collateral valued prior to 2011. Complete findings on the desktop valuations are described in the Corporate methodology (see Section 5.4).

Based upon these findings:

- Valuations for commercial real estate properties underlying SBP loans were updated using a SBP-tailored historical commercial real estate property price series, derived by applying a 50% weighting on the Office Grade B historical index and a 50% weighting on the Residential Multi-Family Grade B historical index
- The peak-to-current indexing haircut was capped to have a maximum decline in value of 39%. This was based upon the aforementioned collateral valuation sample indicating that the full index adjustment may overstate the reduction in collateral values for property valued in 2010 or earlier
- An additional downward valuation adjustment of 7% and 10% is applied to all commercial real estate property values in the Base and Adverse Case respectively. These adjustments are informed by comparisons between desktop valuations performed by CW and NAI Hellas and property valuations indexed to the SBP-specific historical commercial real estate property price series described above. Please see Appendix – Retail for further information.

- Valuations for land collateral underlying SBP loans are also rebased as per the commercial real estate approach described above

Linking Tangible Collateral to Exposures

BlackRock then performed a comprehensive analysis to calculate tangible collateral coverage at the loan level, which was reconciled with each Group A Bank to ensure the accuracy of BlackRock's calculations.

To perform this analysis BlackRock accounted for Bank-specific allocation algorithms[30], and borrowers with non-zero exposure balances. Collateral was first allocated on a borrower basis, and subsequently allocated pro-rata at the loan level across a Borrower's total loan exposures assuming cross-collateralisation.

For example, assuming a borrower holds two loans – Loan 1 and Loan 2 with current funded balances of EUR 400K and EUR 200K, respectively. Both loans are secured via a single property of residential real estate, valued at EUR 900K as of 30 June 2013, with the first lien pledged to Loan 1 and the second lien pledged to Loan 2. In this situation, both loan exposures and available collateral are rolled up to the borrow-level such that the borrower holds a total current funded exposure of EUR 600K, cross collateralised by residential real estate valued at EUR 900K. The residential real estate collateral value is then allocated to both Loan 1 and Loan 2 on a pro-rata basis (i.e., EUR 600K and EUR 300K of collateral value are allocated to Loan 1 and Loan 2, respectively).

To demonstrate the available collateral secured against any given borrower, an Adjusted Capped Collateral Coverage Ratio is calculated by the dividing (a) the sum of the rebased and post-haircut value of all tangible collateral, only including, for each borrower, an amount of collateral up to the Bank's exposure to that borrower and (b) the total borrower exposure. Capping recognises that a Bank can get no further benefit from collateral pledged by a borrower, beyond full payment of the obligations of that borrower. The Adjusted Capped Collateral Coverage Ratio is first determined on a borrower-level and subsequently assigned to a loan-level, assuming cross-collateralisation. This metric is used for cohorting purposes only (see Step 6 for further details).

Step 5 of 7: LGD Model Calculations

BlackRock used the House Price and CRE Price indices provided by the Bank of Greece, to project forward collateral values from the rebased collateral value as of the Reference Date.

Collateral Liquidation Haircuts

For residential real estate, BlackRock applied the same methodology to determine recovery values at liquidation as for Residential Mortgage loans, including forced sale discounts (ranging from -35% to -20% depending on time of liquidation) and liquidation costs to cover legal and transactional expenses (see Section 2.4). For commercial real estate including land, liquidation haircuts of -32% were applied in the Base and Adverse Case incorporating legal expenses, broker fees, preferential claims and a forced sale discount, to determine recovery values at liquidation, subsequent to the rebasing process described above .

[30] If a given borrower had at least one loan that had a first lien claim to a piece of property collateral, it was assumed that all loans of that borrower had a first lien claim on such property collateral

Other types of collateral were subject to liquidation haircuts to determine recovery values at liquidation, informed by the AQR process, external research and relevant experience in other jurisdictions. These adjustments are summarised in the figure below.

Figure 81: SBP Collateral Valuation - Liquidation Haircuts

Collateral Type	Base Case Collateral Haircut	Adverse Case Collateral Haircut
Accounts Receivable/ Inventory	10%[2] or 15%	20%[2] or 25%
Cash / Cash Deposits	2%	5%
Cheques	10%	20%
Commercial Real Estate 1st Lien[1]	32%	32%
Commercial Real Estate Non-1st Lien[1]	90%	95%
Land	32%	32%
Other	30%[3] or 35%	35%[3] or 40%
Residential Real Estate 1st Lien[1]	46% to 31%	46% to 31%
Residential Real Estate Non 1st Lien[1]	90%	95%
Securities	10%	20%
State Guarantee / TEMPME	0%	0%

Note (1): The collateral valuation adjustments in this table for residential real estate, commercial real estate and land do not include drive-by adjustments and adjustments for vendor collateral re-valuation. Residential real estate value varies dependent on time of liquidation due to the level of forced sale discount applied(see Section 2.4)
Note (2): A haircut of 10% and 20% in the Base and Adverse Case respectively was applied to collateral classified as "Accounts Receivable/Inventory" in ATE Bank to reflect higher quality receivable collaterals as gathered during AQR meetings. In contrast, a haircut of 15% and 25% in the Base and Adverse Case respectively was applied to collateral classified as "Accounts Receivable/Inventory" in the other Group A Banks.
Note (3): A haircut of 30% and 35% in the Base and Adverse Case respectively was applied to collateral classified as "Other" in NBG to reflect a large proportion of photovoltaic equipment/off take agreements Equipment collateral classified under this category. In contrast, a haircut of 35% and 40% in the Base and Adverse Case respectively was applied to collateral classified as "Other" in the other Group A Banks.

Specific assumptions were made on the recoverability of the collateral:

- Accounts receivable and inventory collateral was haircut by 15% and 25% in the Base and Adverse Cases, respectively, based on reduced advance rates, the term and quality of receivables. For accounts receivable and inventory collateral in ATE, a discount of 10% and 20% is applied in the Base and Adverse Cases respectively to reflect higher quality receivable collaterals as determined during AQR meetings
- Cash was haircut by 2% and 5% in the Base and Adverse Cases, respectively. Based on discussions with the Banks, this collateral is generally held in bank controlled deposits and associated losses were expected to be minor
- Haircuts on post-dated cheques were 10% and 20% in the Base and Adverse Cases, respectively, taking into account advance rates and information received from the Banks on recoverability of post-dated cheques given default
- Securities collateral value was adjusted by 10% and 20% in the Base and Adverse Cases, respectively to account for the potential volatility in value over time
- For Alpha, Eurobank and Piraeus, a haircut of 35% and 40% in the Base and Adverse Case respectively was applied to collateral classified as "Other". A haircut of 30% and 35% in the Base and Adverse Case respectively was applied to collateral classified as "Other" in NBG to reflect a large proportion of photovoltaic equipment/off take agreements classified under this category
- For personal and corporate guarantees, a haircut of 100% was applied. Recoveries from personal and corporate guarantees are incorporated within the LGD cap discussed later in this section.

Rebased valuations, inclusive of both (i) indexing and (ii) valuation adjustments, for tangible collateral amounted to EUR 26.4BN in the Base Case and EUR 26.1BN in the Adverse Case. On aggregate, residential real estate valuations were subject to a negative rebasing adjustment of 22% inclusive of drive-by adjustments. Commercial real estate and land valuations, on aggregate, were subject to a negative rebasing adjustment, of 27% and 30% in the Base Case and Adverse Case respectively (inclusive of vendor-based valuation adjustments).

Following the application of the liquidation haircuts, total available collateral amounted to EUR 13.8BN in the Base Case and EUR 13.0BN in the Adverse Case. In aggregate, this represents a total reduction of 59% and 61% from the gross collateral values in the Base and Adverse Cases respectively.

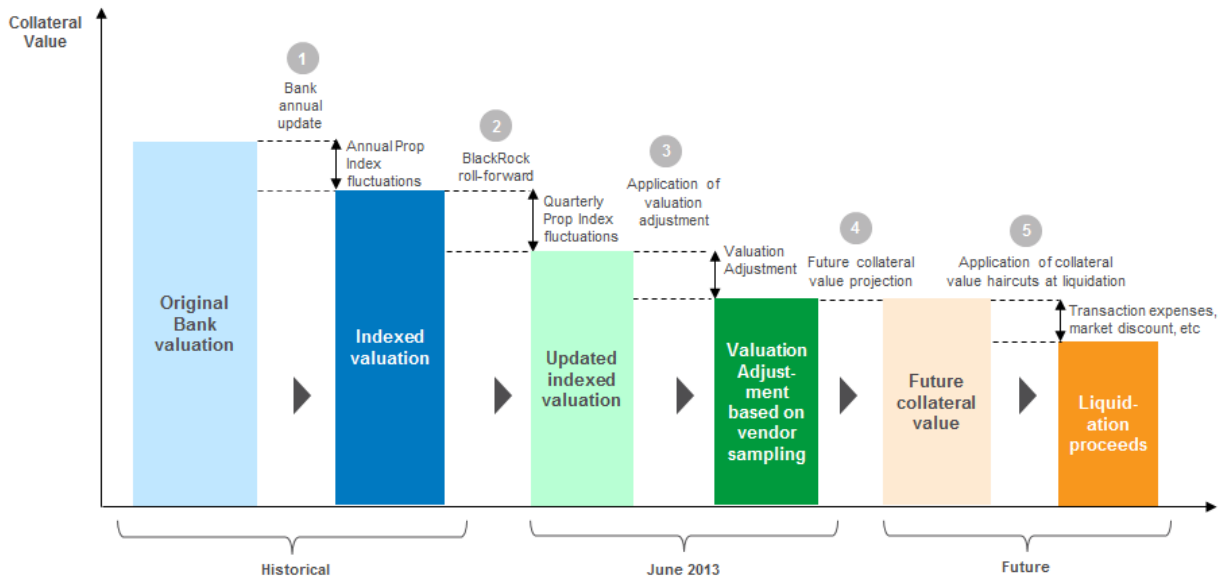
SBP Collateral Haircuts Summary

As described above, BlackRock rebased collateral valuations to current market levels to (i) account for value declines since the last valuation was performed for real estate related collateral and to (ii) estimate realisable market values for non-real estate related collateral. Real estate collateral values were subject to forward valuation haircuts and haircuts to account for preferred claims and liquidation and enforcement costs. It should be noted that the haircuts are cumulative.

An illustration of the collateral valuation sequence applied to residential real estate is provided in Figure 34.

An illustration of the collateral valuation for commercial real estate is shown below. The adjustments were similar to the above and were as follows (i) indexing to 30 June 2013, (ii) collateral valuation adjustment, (iii) forward valuation projections and (iv) commercial real estate and land liquidation haircuts (inclusive of forced-sale discount, tax considerations, preference claims, broker fees and legal costs).

Figure 82 : Collateral valuation sequence – Commercial real estate collateral allocated to SBP loans



LGD Calculation

Loss Given Default of any given loan is derived from the ratio between (a) the sum of the tangible collateral valuation (rebased, post-haircuts and post-forward valuation adjustments) attributed to the loan and (b) the outstanding EAD at the time of default, taking into account repayments, prepayments and cures, at the time of liquidation. BlackRock applied the same methodology as the BlackRock Residential Mortgage model in its use of the Tobit adjustment to account for potential censoring bias arising from utilising observed property index for distressed collateral valuations (see Appendix – Retail for further details on the Tobit adjustment).

To give credit for TEMPME and state guaranteed loans, BlackRock applied a 15% LGD cap for TEMPME loans and a 0% LGD for state guarantee loans. These assumptions were applied in both the Base and the Adverse cases.

BlackRock assumed that LGD is capped at 75% in the Base Case and 85% in the Adverse Case for secured loans (i.e., loans secured by tangible collateral inclusive of TEMPME/state guarantees, but excluding personal guarantees). For unsecured loans, or loans secured only by personally guarantees, the LGD is capped as follows:

- In the Base Case, the unsecured LGD cap decreased from 90%, as of 30 June 2013, to 85%, in a linear fashion over a course of five years until 30 June 2018
- In the Adverse Case, the unsecured LGD cap decreased from 95%, as of 30 June 2013, to 90%, in a linear fashion over a course of five years until 30 June 2018

The evolution of the unsecured LGD cap described above reflects BlackRock's expectation on the potential additional recovery values from personal guarantees given on the macroeconomic forecasts provided by the Bank of Greece.

Step 6 of 7: **Cohorting of Loan Data**

Due to the considerable magnitude of the line-item level data set and the operationally intensive nature of the calculations involved in the SBP model, BlackRock applied a similar methodology as the Residential Mortgage loan model by placing each loan into one of 31,540 categories, or "cohorts" (see Section 2.5 for further details).

A SBP-specific cohorting criteria is based on Adjusted Capped Collateral Coverage Ratio, as described in Step 4 previously. The rationale behind this was to segregate loans with a high level of adjusted collateral coverage from those with low levels of adjusted collateral coverage to prevent cross-collateralisation within a cohort at liquidation. Cohorts were based on narrow bands of Adjusted Capped Collateral Coverage Ratio around the 100% collateral coverage mark, to take into account the forward projections of future house price indices and other macroeconomic factors. This ensured that the loans within a single cohort had similar attributes and characteristics with respect to collateral coverage post liquidation. This process is analogous to the use of LTV as a cohort in the BlackRock Residential Mortgage modelling process.

Step 7 of 7: **Output Generation**

Each cohort was individually run through the model, using its weighted average characteristics to determine projections for prepayment, default, delinquency, and loss severity. After every cohort was run, results were aggregated across cohorts and summed to determine overall portfolio performance.

Losses (projected to occur at the point of liquidation) were reported "at the Time of Default". For any given period, Loss at the Time of Default is the sum of all future losses associated with any balances that transition to 90+ DPD during that period. This calculation is provided for time zero (i.e., for loans that were 90+ DPD as of

the Reference Date), years 1, 2, and 3 (i.e., for balances that transition into 90+ DPD at any point within 1, 2, and 3 years, respectively), and lifetime (for balances that transition into 90+ DPD at any point into the future).

Model Test Statistics: Rank-Ordering Capability

To provide a sense of the Goodness-of-Fit for the model components created by the logistic regression, Concordance Indices for various subsamples are provided below. This statistic measures the rank-ordering capability of probabilistic choice models. For SBP loans, the full sample refers to the model fit that was tested on the full 5-year dataset. The in-sample model was fit on the dataset through the end of 2012 (i.e. the last two transitions were held out). This model was then tested on this in-sample dataset, and out-of--sample on the last two transitions. Overall, the component models perform well out-of-sample, in that there is only a modest deterioration in rank-ordering capability. The one example that illustrates a large drop can be explained by the fact that the out-of-sample dataset shows a different proportion of two relevant factors which rank high in explaining that particular transition.

Figure 83: SBP Loans In- and out-of-Sample Test Results

Asset Class	Transition(s)	Sample[1]	Concordance Index[2]
SBP	Prob(Current->Delinquent) Mod Loans	Full Sample	80.2%
SBP	Prob(Current->Delinquent) Mod Loans	In-Sample	83.8%
SBP	Prob(Current->Delinquent) Mod Loans	Out-of-Sample	72.9%
SBP	Prob(Current->Delinquent) Non-Mod Loans	Full Sample	68.1%
SBP	Prob(Current->Delinquent) Non-Mod Loans	In-Sample	70.0%
SBP	Prob(Current->Delinquent) Non-Mod Loans	Out-of-Sample	60.0%
SBP	Prob(Delinquent->Current)	Full Sample	68.9%
SBP	Prob(Delinquent->Current)	In-Sample	68.7%
SBP	Prob(Delinquent->Current)	Out-of-Sample	52.4%[3]
SBP	Prob(Delinquent->Default)	Full Sample	61.4%
SBP	Prob(Delinquent->Default)	In-Sample	62.3%
SBP	Prob(Delinquent->Default)	Out-of-Sample	65.2%
SBP	Prob(Default->Delinquent)	Full Sample	60.0%
SBP	Prob(Default->Delinquent)	In-Sample	61.3%
SBP	Prob(Default->Delinquent)	Out-of-Sample	53.1%

[1] The last two transitions were set aside for out-of-sample testing. The "Full" Sample refers to the complete dataset, and the model that was used for computing the CLPs.

[2] The Concordance Index is obtained from: $C = (n_c + 0.5*(t - n_c - n_d))/t$, where n_c = # of pairs concordant, n_d = # of pairs discordant, and t = # of pairs with different responses. The popularly known Gini Coefficient (or Somers' D) is simply 2*C-1.

[3] This rank-ordering statistic is depressed by a larger number of "ties" in the out-of-sample dataset compared to the full and in-sample ones. The ties arise from the fact that the out-of-sample dataset shows a different proportion of loans with respect to Payment Type and Loan Modification Flag, factors which ranks high in the transition from Delinquent to Current.

4.5. Group B Banks

4.5.1. Portfolio Stratifications

Leveraging the same standardised line-level templates used for the Group A Banks, BlackRock requested cross-sectional loan exposure and collateral information as of the Reference Date from the Group B Banks. Of the 7 Group B Banks, only TT reported holding SBP loan exposures. However, TT did not provide BlackRock with any collateral-level data files concerning collateral security underlying the SBP portfolio.

In line with the approach for Group B Banks in the Residential and Consumer asset classes, BlackRock produced summary stratification tables in a standard output format for TT's SBP portfolio. These reports were

reviewed by BlackRock to identify key portfolio characteristics and risk drivers. Due to time constraints, these reports were not separately shared with the TT. However, TT did submit basic balance reconciliation data, including key fields such as Current Funded Balance and percentage of Non-Performing Loans, to aid BlackRock in checking the general accuracy of data file being analysed. Where necessary, BlackRock communicated with each Bank to seek clarification regarding specific inconsistencies or other issues identified by BlackRock. These concerns were addressed by the Banks to the extent practical in given the compressed time frame during which this analysis was conducted.

Please note that TT's SBP current funded balance of EUR 49MM represents 0.8% of the total TT Retail portfolio (EUR 6.2 BN). The SBP portfolio size of TT also represents only 1.0% of the Group A Bank average current funded balance exposure size of EUR 5.1 BN.

A stratification of all SBP loan exposures across the Group B Banks is shown the Figure below.

Figure 84: Overview of Group B Bank SBP Portfolios

		TT Hellenic Postbank	Group B Total	Group B Avg.
Portfolio Exposure	Funded (EUR MM)	49	49	
Performance Status	Current (0-89 DPD, %)	87		87
	Delinquent (90-359 DPD, %)	*9*		*9*
	Defaulted (360+ DPD, Denounced, %)	*4*		*4*
	Adjusted 90+ DPD[1] (%)	0		0
Loss Mitigation	Total Loss Mitigation	5		5
	Modified, Current (0-89 DPD, %)	5		5
	Modified, Delinquent (90+ DPD, Denounced %)	0		0
Security	Secured by Tangible Collateral (%)[2]	54	54	54
Loan Characteristics	Number of Borrowers (K)	2	2	
	Number of Loans (K)	2	2	
	Average Loan Size (EUR K)	29		29
	WA Coupon (%)	10		10
	WA Seasoning Term[3] (Months)	38		38
	Revolving (%)	75		75
	Government Guaranteed (%)	1		1

Note (1): Adjusted 90+ DPD metric includes loans 90+ DPD or loans which are Current and have been Modified
Note (2): Collateral-level data file was not provided by TT. Secured by Tangible Collateral metric based upon collateral information gathered from the loan-level data file submission
Note (3): Seasoning term is defined as months since modification date for Modified loans and months since origination for non-Modified loans

4.5.2. Methodology Overview

The approach for Group B Banks, namely TT, was broadly similar to that for the Group A Banks. Due to the small size of the TT SBP portfolio, loan-level information provided to BlackRock was cohorted by performance status and loss mitigation only. These cohorts were subsequently run through the BlackRock SBP Model in the same manner as for Group A Banks.

One difference from the method used for the Group A was, that the SBP model was not estimated using Group B Bank data. Instead, the TT loans were analysed using a model estimated based on Group A Bank historical information.

Another difference was driven by the fact that the TT did not provide the requested collateral-level data files to BlackRock. Therefore, BlackRock utilised high-level assumptions regarding TT's collateral security coverage for SBP loans based upon (i) collateral information gathered from the loan-level data file submission and, where

appropriate, (ii) collateral coverage information from Group A Bank average. In particular, BlackRock assumed:

- 46% of TT's current funded balance was secured by personal guarantees only
- 18% of TT's current funded balance was secured by real estate collateral
    - The split of such collateral coverage between residential real estate and commercial real estate, as well as between first lien and lower-liens, were informed by Group A Bank averages
    - Real estate property valuations were assumed to be 120% of the corresponding current funded balance, after taking into account indexing and rebasing
- 4% of TT's current funded balance was covered by cash or cash-equivalent securities
- 32% of TT's current funded balance was covered by other collateral

Corporate Loans

5.1 Scope of Asset Quality Review

As of 30 June 2013, the total funded balance for Corporate loans was EUR 30.8 BN across Group A Banks and EUR 3.8 BN across Group B Banks. The purpose of the Asset Quality Review (AQR) was to provide an assessment of the assets held by each Bank and to gather qualitative information regarding Banks' lending practices, portfolio monitoring, and workout procedures. BlackRock assessed Corporate loan asset quality through the following processes:

- Conducted due diligence sessions to review and discuss bank history, product types, origination strategy, portfolio performance, loss mitigation practices, and collateral valuation and recovery efforts
- Reviewed loan and collateral portfolio data for Group A and Group B Banks as of 30 June 2013. For Group A Banks, BlackRock also conducted an in-depth analysis of 5 year historical performance and ratings data, which was used to model probabilities of default
- Performed manual re-underwriting of a sample of 128 Large Loan borrower exposures totalling EUR 11.3 BN at the Group A Banks in order to assess sustainable debt capacity for each borrower and to estimate potential credit losses

These qualitative and quantitative factors served as inputs to inform BlackRock PD and LGD models developed to generate CLP results.

The due diligence process for Group A Banks included an original RFI sent to each Bank prior to management due diligence sessions, loan-level data requests, and follow-up RFIs as necessary. The Corporate RFI covered the following main areas:

- Lender profile and organisational history
- General product features and portfolio stratifications
- Origination and underwriting strategies
- Credit review and monitoring processes
- Payment collections
- Loss mitigation strategies
- Credit performance projections
- Collateral valuation and recovery practices, including collateral liquidation and valuation of non-tangible guarantees
- Internal rating models
- Status of any merger integrations, including any effects on banking practices and data systems

BlackRock held 2 day-long due diligence sessions with the management teams at each Group A Bank to cover all Commercial asset classes, while one-day due diligence sessions were held to discuss both Retail and Commercial asset classes at Group B Banks. In addition to the above RFI topics that were covered during management presentations, BlackRock also requested specific documentation to be submitted by each Group A and Group B Bank, including:

- Loan-level data covering the scope of analysis as of the reference date
- Collateral data tapes
- 5 years of historical ratings information (Group A Banks only)
- Credit policy and collateral valuation manuals
- Description of internal rating scales
- Detailed description of the Corporate loan portfolio by various stratifications (such as risk categories)

- Product type descriptions
- Loan underwriting and credit approval documentation
- Bank organisational structure for Corporate loan underwriting, loan servicing, and payment collection department
- Descriptions of modification options used for Corporate loans
- Description of workout and loss mitigation strategies

If any information was unclear or incomplete from the due diligence sessions or data submissions, BlackRock submitted written follow-up RFIs, exchanged emails with relevant Bank employees, and held follow-up calls, where necessary.

5.2 Portfolio Stratifications and Risk Analysis

Data Collection and Review

In order to obtain an accurate and comprehensive understanding of the exposures held across the Banks, BlackRock built a standardised loan-level data template tailored to Greek commercial loans which covered over 200 data fields, across the following categories:

- Borrower characteristics - Unique identifier[31], borrower type, region of risk, industry sector, etc.
- Loan characteristics - Unique identifier, facility type, funded balance, unfunded balance, total limit, term, etc.
- Credit Performance - Internal rating, days past due, arrears balance, loan status, etc.
- Collateral information - Unique identifier, collateral type, collateral value, date of last Bank valuation, lien information, etc.

Upon receipt of Bank submissions, BlackRock downloaded and on-boarded the datasets to a database system, which facilitated the organisation and standardisation of data across various output formats (i.e., .txt, .xls, etc). This process allowed for the creation of portfolio stratifications, data gap reports, and mapping of key fields to model categories. The original data submissions by the Banks varied in the level of completeness, and over the course of several weeks, BlackRock and the Banks engaged in a comprehensive data reconciliation process.

BlackRock produced detailed stratification tables and compared these tables to summary information provided by each of the Banks to confirm balances and key risk factors. This process allowed the Banks to acknowledge that the data supplied to BlackRock was consistent with the Banks' own understanding of their respective portfolios. Inconsistencies were addressed via iterative data re-submissions, email correspondence, teleconferences, as well as in-person meetings.

Portfolio Summary Statistics

The total exposure of the Group A Bank Corporate universe (ex CRE and Shipping) amounts to EUR 39.7 BN, of which EUR 30.8 BN represents funded balances as of 30 June 2013. Piraeus has the largest share of Corporate funded balance at EUR 11.8 BN (38% of total) followed by Alpha at EUR 8.5 BN (28% of total).

The table in the figure below contains an overview of key characteristics and risk metrics of Corporate exposure across the entire Group A Banks universe, side-by-side and relative to the Group A average.

[31] For Banks that had recently acquired institutions (Alpha Bank, NBG and Piraeus), BlackRock requested a unique identifier covering the parent Bank and its acquired Banks.

Figure 85: Overview of Group A Banks Corporate Loan Portfolios[32]

		Alpha	Eurobank	NBG	Piraeus	Total
Portfolio Limits	Funded (€MM)	8,460	4,511	5,946	11,834	30,751
	Unfunded Committed (€MM)	30	699	1,855	1,684	4,269
	Unfunded Uncommitted (€MM)	2,816	1,138	249	498	4,701
	Total Limit (€MM)	11,306	6,348	8,049	14,016	39,720
Performance Status	Current (%)	83%	87%	74%	61%	74%
	Defaulted (%)	*17%*	*13%*	*26%*	*39%*	*26%*
	90+ dpd (%)	*16%*	*11%*	*17%*	*30%*	*21%*
	Denounced (%)	*11%*	*4%*	*8%*	*8%*	*8%*
Loss Mitigation	Current Modified (0-89 dpd, %)	*3%*	*10%*	*20%*	*13%*	*11%*
	Modified Defaulted (%)	*0%*	*4%*	*5%*	*4%*	*3%*
Security	Secured by Tangible Collateral (%)	*63%*	*53%*	*61%*	*68%*	*63%*
Loan Term	WA Remaining Term (years)	2.1	1.9	2.2	3.3	2.6

- The aggregate percentage of defaulted balances across all Group A Banks was approximately 26%, while loss mitigation was reported for 14% of the total universe
- The weighted average percentage of funded exposure secured by tangible collateral amounts to 63% across all Group A Banks. Piraeus had the highest secured coverage, at 68% of funded balance, and Eurobank had the lowest secured coverage across the Group A Banks, at 53% of funded balance.
- The weighted average remaining term of Corporate loans was 2.6 years across the Group A Bank universe
- NBG had the largest percentage of loss mitigation reported to-date. However, it is important to note that loss mitigation definitions and tracking policies are not entirely consistent across Banks. For example, it is important to note the following about Alpha's modification statistics:
    - Alpha does not maintain rescheduling information in its systems, which results in a systematic understatement of modified exposure at the Bank
    - While restructuring information is maintained for non-defaulted exposures (via a "Restructured" rating category), the flag is removed as soon as the exposure enters default. As a result, Modified Defaulted exposure is reported at 0%

5.3 Large Loan Underwriting

Large Loan file reviews were based on samples selected according to certain sampling criteria presented in the following paragraphs. Therefore, any quantitative or qualitative results derived by BlackRock should not be extrapolated to apply to the entire portfolio from which the sample was taken or to the respective Bank. Results should be interpreted as directional and indicative in nature only. They should also only be assessed in conjunction with the results from other qualitative and quantitative processes performed during the AQR process.

Overview of Large Loan Underwriting

The BlackRock Large Loan underwriting team consisted of 10 staff members, with 4 of the 10 underwriters focused on CRE loans and the remaining 6 underwriters focused on Corporate, State-Related, and Shipping loans. The underwriting team had on average 10 years of experience in corporate lending, leveraged loans and/or the workout and restructuring of distressed portfolios with specific credit experience in Greece. The Banks had made available physical files for each borrower in a data room located on their respective premises. One underwriter was assigned as the primary lead for each name and was responsible for the underwriting

[32] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

from start to finish. Each underwriting result was reviewed by the leadership committee of the Commercial team and the entire team of underwriters. Certain credits were further reviewed by the broader team to ensure quality control.

As part of the portfolio data submission process, the Large Loan universe across Corporate, CRE and State-Related exposures reported by the Group A Banks and defined as all exposures with an aggregate funded and unfunded exposure in excess of EUR 25 MM at the borrower level ("Large Loan"), amounted to EUR 30.7 BN in funded exposure. The Large Loan universe for which credit losses were estimated was split into three categories: Corporate (or General Industries), CRE and State-Related.

As part of the AQR workstream, BlackRock conducted a credit file review and manual re-underwriting on a sample of 128 borrower exposures representing 37% of the total Large Loan universe.

BlackRock was able to extend the universe of exposures for which credit losses were based on fundamental credit file review by an additional 56 borrowers, or 10% of the Large Loan universe. This was achieved by identifying the same or similar credit exposure within facilities held across the Group A Banks to which results could be mapped (for example, a pari-passu syndicated facility or an unsecured facility with exactly the same recourse to the borrower). As a result, BlackRock was able to apply manually underwritten credit losses to 47% of the Large Loan universe which is detailed below by Bank and segment. The Group A Banks Large Loan sample universe and the percentage coverage achieved is detailed below by bank and borrower category.

Figure 86: Underwritten Large Loan Sample[33]

	Sample # Borrowers			Sample Funded Exposure (EUR MM)				
Bank	Underwritten	Mapped	Sample Total # of Borrowers	Underwritten	Mapped	Sample Total Funded Exposure (EUR MM)	Total Funded Exposure (EUR MM)	Total % Covered
Alpha	***37***	***16***	***53***	***2,638***	***1,513***	***4,151***	***6,088***	***68%***
CRE	7	-	7	432	-	432	526	82%
Corporate	26	15	41	1,865	873	2,737	4,580	60%
State Related	4	1	5	342	640	982	982	100%
Eurobank	***28***	***6***	***34***	***1,946***	***201***	***2,148***	***3,704***	***58%***
CRE	7	-	7	264	-	264	346	76%
Corporate	19	5	24	1,299	151	1,451	2,852	51%
State Related	2	1	3	383	50	433	506	86%
NBG	***26***	***14***	***40***	***2,835***	***553***	***3,388***	***7,539***	***45%***
CRE	3	-	3	243	-	243	272	89%
Corporate	19	12	31	1,599	444	2,044	5,953	34%
State Related	4	2	6	994	108	1,102	1,314	84%
Piraeus	***37***	***20***	***57***	***3,910***	***923***	***4,833***	***13,339***	***36%***
CRE	6	1	7	329	78	406	1,235	33%
Corporate	29	16	45	2,564	655	3,219	10,439	31%
State Related	2	3	5	1,017	190	1,208	1,665	73%
Total	***128***	***56***	***184***	***11,330***	***3,190***	***14,519***	***30,670***	***47%***
CRE	23	1	24	1,267	78	1,345	2,379	57%
Corporate	93	48	141	7,327	2,124	9,450	23,824	40%
State Related	12	7	19	2,736	989	3,724	4,467	83%

Large Loan Sample Selection Process

In order to gain a comprehensive insight into the Greek commercial lending environment, BlackRock used a diverse set of selection criteria for the Large Loan sample selection process, targeting the following:

- Large and complex exposures across industries and CRE
- Borrowers with exposures held across multiple Banks, in order to compare the lending approach and credit monitoring and assessment of each Bank for the same borrower. This approach also allowed BlackRock to gain a better understanding of that particular borrower
- Cross-sectional loan sample from all top industries of a particular Bank

[33] The categorisation used by BlackRock for the Large Loan Underwriting may differ from categorisation used by BlackRock for results or asset class stratification tables. For example, certain loans might be categorised as CRE for Large Loans and Leasing for the purpose of asset stratification. As a result, the Total Funded Balance might not be directly comparable between Large Loan and other tables.

- Ensuring that the vast majority of the top 20 borrower groups across the Group A Banks were represented
- Smaller loans (still over EUR 25 MM) from industries which were not well represented amongst the largest exposures
- A mix of performing and non-performing exposures
- A mix of loans sampled during the 2011 Diagnostic and those outside of the 2011 sample. The 2011 sample names were included to evaluate how the credit and loss profiles have changed in addition to how a Bank's monitoring may have evolved over the past 2 years
- Sufficient population of State-Related exposures to provide further insight into the nature of state support

Re-underwriting Approach

BlackRock's re-underwriting process included a comprehensive review of the physical (and in some instances, electronic) files made available by the Banks. Loan files typically included the Bank's credit reviews, borrower financial information, loan facility and security documents, and relevant third-party collateral valuation reports. In addition, BlackRock underwriters had the opportunity to engage with the respective RM at the Bank to obtain clarification or further information on selected credits. Follow-up discussions were frequently held with the RM via email, phone or in-person.

To support the underwriting analysis, BlackRock also reviewed publicly available borrower-specific information as well as industry and market research to supplement the information provided by the Banks. Specifically, BlackRock's borrower-specific re-underwriting process included the following analyses:

- Evaluation of business fundamentals, including current and historical operating performance
- Financial projections for the underlying business, informed by macroeconomic assumptions such as GDP, inflation and disposable income, as provided by the Bank of Greece
- Estimation of sustainable debt capacity with regard to estimated free cash flow
- Review and valuation of borrower assets that may provide recovery or add value to the core business
- High level review of relationship to the State, including State ownership and terms of guarantee agreements (if applicable)
- Review of the capital structure and comparison of leverage to the estimated sustainable EBITDA and free cash flow
- Analysis of the key risks inherent for each borrower, including financial and operational risks
- Review of comparable companies in terms of leverage multiples, enterprise values and pricing, when available
- Liquidation analysis based on collateral value for exposures which were not deemed a going concern
- For troubled credits, an effort was made to understand the Banks' workout and restructuring approach

BlackRock used the above analyses to project the magnitude and timing of potential credit losses (not taking existing provisioning levels into account) and compile summary credit reports for each exposure, including the assignment of an indicative BlackRock rating. Each underwriting result was reviewed by the Commercial team's leadership committee and the entire underwriting team. Certain credits were then further reviewed by a broader team for quality control purposes to ensure thoroughness of analysis.

Key Statistics of Underwritten Sample

Certain key credit metrics for the Corporate (or General Industries) category derived from the Large Loan file review exercise are summarised below. The Figure below shows the distribution of the Corporate Large Loan sample (excluding Public loans[34]) by range in % change of revenues and the corresponding estimated Base

[34] State-Related 1a and 2

Case credit losses.

Figure 87: 2-Year Cumulative Change in Revenue for Underwritten Large Loans – Corporate only[35]

Change Range	No. of Borrowers	Funded Balance (EUR MM)	Funded Balance (%)	Indicative Rating	Loss (% of Funded)
Increase >35%	5	368	5%	Caa1	3%
Increase 20%-35%	1	35	0%	B1	0%
Increase 5%-20%	5	1,314	17%	Ba3	1%
Change between -5% to +5%	15	1,096	15%	B3	28%
Decrease 5%-20%	18	1,047	14%	Caa2	33%
Decrease 20%-35%	15	865	12%	Caa2	45%
Decrease >35%	14	1,207	16%	Caa3	52%
N/A	21	1,585	21%	Caa3	72%
Total	**94**	**7,517**	**100%**	**Caa1**	**38%**

A total of 42% of the underwritten sample by funded exposure experienced a 2-year decline in revenues of at least 5% which, in many cases, represented a further extension in the decline in revenues that started in 2009. Furthermore, 16% experienced a decline of over 35%. Only 22% of the borrowers experienced an increase in revenues greater than 5%. These statistics reflect the challenging Greek macroeconomic fundamentals over the previous 2 years.

The Figure below shows the distribution of the Corporate Large Loan Sample (excluding Public loans) by 2012 EBITDA margins and the corresponding estimated Base Case credit losses.

Figure 88: 2012 EBITDA Margin for Underwritten Large Loans – Corporate only[36]

Margin Range	No. of Borrowers	Funded Balance (EUR MM)	Funded Balance (%)	Indicative Rating	Loss (% of Funded)
above 20%	13	744	10%	B3	9%
from 10% to 20%	20	1,008	13%	B3	21%
from 5% to 10%	6	359	5%	Caa2	14%
from 0% to 5%	12	1,884	25%	B1	11%
from -5% to 0%	6	522	7%	Caa3	50%
below -5%	18	1,554	21%	Caa3	59%
N/A	19	1,446	19%	C	79%
Total	**94**	**7,517**	**100%**	**Caa1**	**38%**

28% of the borrowers by exposure reported a negative EBITDA margin (as a % of revenue) in 2012. Another 25% reported EBITDA margins in the 0-5% range. These statistics highlights the impact of the decline in revenues and resulting pressure on profitability that a majority of the borrowers in the sample are experiencing.

The Figure below shows the distribution of the Corporate Large Loan sample (excluding Public loans) by the Debt to LTM EBITDA ratio and the corresponding estimated Base Case credit losses.

[35] The funded balance of Corporate loans is slightly higher than the funded balance of Corporate loans re-underwritten in the table "Manually Re-Underwritten Large Loan Sample" as this analysis includes 1 loan that was later determined to be out of scope.

[36, 9] The funded balance of Corporate loans is slightly higher than the funded balance of Corporate loans re-underwritten in the table "Manually Re-Underwritten Large Loan Sample" as this analysis includes 1 loan that was later determined to be out of scope.

Figure 89: Debt to LTM EBITDA Ratios for Underwritten Large Loans – Corporate only[37]

Multiple Range	No. of Borrowers	Funded Balance (EUR MM)	Funded Balance (%)	Indicative Rating	Loss (% of Funded)
0.0x to 4.0x	9	475	6%	Ba3	0%
4.0x to 8.0x	16	1,087	14%	B2	2%
8.0x to 12.0x	3	181	2%	Caa2	12%
12.0x to 16.0x	4	206	3%	Caa1	25%
Above 16.0x	18	2,061	27%	B3	18%
Loss-making	24	1,878	25%	Caa3	58%
N/A	20	1,628	22%	C	80%
Total	**94**	**7,517**	**100%**	**Caa1**	**38%**

Only 6% of borrowers by exposure had a Debt-to-LTM EBITDA multiple of less than 4.0x, a level which is generally seen as sustainable for most industries. 14% reported Debt-to-LTM EBITDA multiples between 4.0x and 8.0x, which can be characterised as highly levered for most industries. 32% reported Debt-to-LTM EBITDA multiples in excess of 8.0x, which can be considered as an unsustainable level of debt for most industries. 25% were characterised as "loss-making", causing the Debt-to-LTM EBITDA multiple to be not meaningful for the current period. These metrics highlight the highly levered profile of Greek corporate borrowers in today's economic landscape.

The Figure below shows the distribution of the Corporate (excluding Public loans) borrowers underwritten and the corresponding losses derived, by industry.

Figure 90: Corporate Large Loan Underwriting Results by Industry[38]

Industry	# Borrowers	Funded Exposure (€ MM)	Base Case Loss %	Adverse Case Loss %
Agricultural & Fisheries	3	124	45%	58%
Auto Retailer	4	247	64%	72%
Chemical Products	2	255	97%	97%
Construction	8	627	32%	53%
CRE	2	166	90%	92%
Ferries	3	191	56%	80%
Financial Services	1	291	93%	94%
Food	3	131	29%	38%
Gaming and Gambling	1	31	0%	0%
Healthcare Services	4	276	42%	50%
Holdco	5	394	45%	48%
Investment co	8	594	63%	72%
Manufacturing	6	386	41%	56%
Media & Publishing	6	232	54%	67%
Metallurgy	8	802	60%	74%
Mining	2	136	0%	0%
Motorway Concessions	3	120	0%	14%
Natural Resources & Energy	8	1,592	0%	18%
Pharmaceuticals	2	75	0%	22%
Retail&Wholesale	5	224	31%	41%
Services	1	66	88%	90%
Supermarkets	3	320	4%	21%
Technology, Media and Telecoms	4	131	0%	0%
Tourism & Leisure Real Estate	1	48	88%	91%
Utilities	1	57	0%	0%
Total	***94***	***7,517***	***38%***	***50%***

5.4 Modelling Methodology

Note: The methodological approach described in this section applies to all Commercial non-Shipping exposures and will be referenced in the relevant asset class specific sections of this report (e.g., SME, Leasing, Factoring, CRE)

Corporate CLP modelling incorporated several key steps including data collection and reconciliation, loan-level data analysis, collateral data analysis, historical data and cure analysis as well as incorporation of AQR due diligence and Loan File Review findings. This section provides an overview of the Commercial modelling process, but each component is described in more detail in the EAD, PD and LGD sub-sections that follow.

Data Collection and Reconciliation

As previously described in Section 5.1, BlackRock collected cross-sectional loan-level data as of 30 June 2013 including borrower, loan, credit performance and collateral data and requested historical ratings data, with most Banks providing 5 years of ratings history. As part of the quality control process, BlackRock reconciled aggregate balances to regulatory reporting and ensured there was sufficient coverage of the Reference Date loan universe in the historical ratings dataset.

Loan Data Analysis

BlackRock stratified each Bank's raw data tapes and mapped key field values to consistent categories across

[38] The funded balance of Corporate loans is slightly higher than the funded balance of Corporate loans re-underwritten in the table "Manually Re-Underwritten Large Loan Sample" as this analysis includes 1 loan that was later determined to be out of scope.

Banks for modelling purposes (e.g., fixed vs. floating interest rate types, amortising vs. bullet). BlackRock determined the Day 0 defaulted universe for each Bank by using a combination of performance fields available in the data tape (e.g., default/legal rating, DPD, loan status fields).

Historical Data & Cure Analysis

BlackRock determined statistical relationships between the historical performance of the loans and both the cross-sectional data and the macroeconomic factors with greatest predictive power. The dataset was restricted to the first occurrence of default in order to limit the effect of historical modifications on the derived probabilities of default. The effects of modification were captured separately through a ratings adjustment described below. BlackRock analysed historical ratings transitions from default to performing ratings in order to determine cure rate assumptions for the model (see 5.4.1 Exposure at Default section below for more detail)

Collateral Analysis

BlackRock determined the link between loan and collateral tapes using unique IDs for each Bank, and mapped collateral types to consistent categories across Banks. Forward-looking value curves were produced for real estate, and liquidation haircuts were incorporated into the analysis.

Incorporation of AQR Due Diligence and Loan File Review Findings

BlackRock incorporated name-level credit loss overrides based on results from the Large Loan underwriting exercise. In addition, BlackRock used supplementary data submissions from the Banks and due diligence findings to inform key model assumptions such as recovery timeline, treatment of modified loans, and unsecured recovery assumptions, among others. Further, real estate collateral valuation exercise results were used to inform collateral value adjustments, based on a comparison to Bank-provided values (see 5.4.3 LGD section below for more detail).

Model Framework

For the purposes of estimating the CLPs for the Corporate loan portfolios, BlackRock employed a two-part methodology, as shown below:

Figure 91: Corporate CLP Two-part Modelling Approach

The first part consisted of a fundamental re-underwriting and forecasting of losses at the borrower level for a selected sample as part of the Large Loan underwriting (as described in Section 5.3.). The second part consisted of statistical loss forecasting for the remaining portfolio for which loans were not underwritten ("Out-of-Sample Portfolio") according to a ratings-based expected loss approach. This approach incorporates exposure at default ("EAD"), probability of default ("PD") and loss-given-default ("LGD") as the main parameters in estimating losses over time. The CLP on an individual corporate loan is calculated as follows:

CLP = EAD * PD * LGD

As of the Reference Date, there are three main categories of the loan universe that are treated differently from an analytical perspective. The approach to each segment is summarised below with a more detailed description provided in the ensuing EAD, PD and LGD sections.

I. ***Clean Performing*** – performing exposures that have not been modified based on the information provided.
   - For this segment, PDs are derived through a regression-based historical ratings data analysis, which provides a default forecast based on the rating as of the Reference Date
   - The estimation data set is adjusted to remove historical modification effects
   - Separate PD models are run for SME and Non-SME asset-classes

II. ***Performing Modified or Current Modified*** – exposures that are performing as of the Reference Date that have been modified previously
   - Downward rating adjustments are applied to this segment, informed by bank due diligence sessions and an analysis of re-default rates of modified loans. In Greece, two categories of loan modifications are distinguished by the banks:
      i. Restructured – modification of loan terms for borrowers in serious difficulty; normally performed after an event of default has occurred
      ii. Rescheduled – modification of loan terms in order to alleviate temporary liquidity constraints; normally applied before an event of default

III. ***Defaulted*** – comprehensive default definition, based on a combination of default flags from the data tapes, crossed at the borrower level. The defaulted category is comprised of the following components:
   - Legal defaulted – denounced exposures which go through a recovery analysis with no cure expected
   - Non-legal defaulted – defaulted non-denounced exposures, part of which cure and return to performing status, with the remainder going through a recovery analysis

5.4.1 Exposure at Default

The exposure at default ("EAD") represents the entire funded balance exposure and an assessment of the likelihood of future draws on existing Bank commitments in the loan portfolio. In determining the EAD assumptions, BlackRock considered the funded, unfunded-committed and unfunded-uncommitted exposures as submitted by the Banks. Specifically, the following assumptions were applied to calculate exposure at default:

EAD = 100% of the Current Funded Balance
+ 10% of the Unfunded-Committed Balance
+ 5% of the Unfunded-Uncommitted Balance

Note: BlackRock assumed no further draws on the unfunded balance for exposures already in default as of the Reference Date.

Unfunded-committed balance is defined as an unfunded exposure where the Bank has a firm commitment to provide funds under the terms of the contract. Unfunded-uncommitted balance is defined as an exposure where disbursement of funds is completely at the discretion of the Bank (e.g., working capital facility increase). The percentages of unfunded-committed and unfunded-uncommitted balances that were used to calculate EAD were determined through discussions with Bank management regarding the nature of unfunded exposures and the resulting likely draw rates. This was further informed by Large Loan underwriting and SME LFRs.

Over time, EAD is a function of amortisation, default flows, prepayments and cures. Key model framework assumptions are detailed below.

Amortisation and Prepayments

With respect to amortisation, BlackRock assumed 3% per annum in the Base Case and 2% in the Adverse Case based on due diligence sessions with management and an analysis of the change in portfolio balance of

the comparable portfolio universe from June 2011 through to June 2013. BlackRock assumed a prepayment rate of 1% per annum in the Base Case and 0% in the Adverse Case. This low prepayment rate is in line with the LFR findings, which showed that a considerable percentage of borrowers are currently struggling to make contractual amortisation payments and the limited ability to refinance with other banks due the constrained funding environment.

Day 0 Defaulted Adjustment

BlackRock incorporated a Day 0 Defaulted adjustment, where relevant credit performance metrics were combined to derive a comprehensive default definition. BlackRock marked loans as Day 0 defaulted if: (i) the loan was classified in the Defaulted Internal Rating, or (ii) the loan was 90+ DPD, or (iii) the loan status was defined as Defaulted or Legal. BlackRock classified all the loans from a borrower as defaulted if at least 5% of the balance was marked as defaulted as per the default definition described above. This "crossing" of the defaulted definition at the borrower level resulted in a 4 percentage points upward adjustment versus the stand-alone loan-level 90+ flag. The differences by Bank are shown in the Figure below.

Figure 92: Day 0 Defaulted "Waterfall"

		Incremental Additions to 90+					
Bank	% of Loans 90+ DPD	NPL	Default status	Default rating	Borrower 5% Crossing[1]	Day 0 Defaulted[2]	Delta vs. 90+ dpd
Alpha	25.0	0.1	0.0	1.1	0.1	26.3	**1.3**
Eurobank	22.9	0.0	1.5	0.0	0.3	24.7	**1.8**
NBG	19.4	0.0	0.0	4.6	0.1	24.1	**4.7**
Piraeus	36.8	0.0	0.0	5.8	0.7	43.3	**6.5**
Total	**28.9**	**0.0**	**0.2**	**3.5**	0.4	**33.0**	**4.2**

Note:

1. "Borrower 5% crossing" is calculating by marking a borrower in default if at least 5% of the borrower balance is in default, based on the data flags shown in the table above
2. "Day 0 Defaulted" flag is applied if any of the flags mentioned in the "incremental additions" section above are present, crossed at the borrower level

As shown above, the addition of the defaulted rating for each Bank to the 90+ DPD flag results in a more comprehensive and consistent definition of default across Banks. For Piraeus which had the largest upward adjustment of 6.5%, the difference was primarily driven by Millennium and CPB, where the difference between the loan-level 90+ DPD flag and Day 0 Defaulted was 17 and 8 percentage points of each Bank's funded balance, respectively.

Minimum Maturity Assumption

BlackRock applied a minimum maturity assumption if either maturity information was missing from the data tape, or if time to maturity was lower than the minimum maturity threshold. This assumption was incorporated on the basis that many loans are unlikely to pay off or refinance and would therefore be extended by the Bank. BlackRock waived the minimum maturity assumption if the borrower rating was R_6 or better on the 16 grade master scale (see 5.4.2 Probability of Default section for more detail). The implicit assumption was that high credit quality borrowers would be able to pay off the loan, either through business cash flow or through refinancing. BlackRock assumed a time-to-maturity floor of 3 years in the Base Case and 4 years in the Adverse Case.

Cure Assumptions

Model cure assumptions were informed through historical ratings data analysis and findings from the due diligence sessions with management. Specifically, BlackRock reviewed Bank criteria under which borrowers get downgraded to a default rating and upgraded from a default rating to a performing rating. BlackRock also explored the distinction between Default Non-Legal and Default Legal segments, and Banks' management

confirmed that denounced loans (i.e., loans in legal status) were not expected to cure. As a result, cure assumptions were only applied for the non-Legal defaulted category. Further, BlackRock found that types of modifications performed which were responsible for a large percentage of cure activity were predominantly short term extensions and grace periods. Both Large Loan underwriting and SME loan file review found limited evidence of longer term extensions or principal modifications that would resize the existing debt burden based on a cash flow-based debt sustainability analysis; this was also confirmed from management due diligence meetings. This resulted in high re-default rates on modified loans.

Based on these findings, BlackRock carried out a "Clean Cure" analysis by focusing on historical transitions of exposures in the non-Legal defaulted category that cured to a performing state and stayed there over a 2 year period, without dipping in and out of the Defaulted / Modified state ("Clean Cures"). This approach resulted in an approximately 70% downward adjustment to the cures derived if "Dirty Cures" (i.e., instances where borrower dipped in and out of the performing state during the analysis phase) had been included. Specifically, based on a 2-year Clean Cure analysis for the starting non-legal defaulted cohort, BlackRock assumed a one-off 5% cure from the starting defaulted balance as of the Reference Date in both the Base and Adverse Case. For cures on future default flows, BlackRock assumed a 7% cure rate in the Base and 5% in Adverse Case given that new defaults should benefit from improving macroeconomic conditions going forward.

Figure 93: 2-Year "Clean Cure" Analysis Summary (starting from Non-Legal defaulted category)

	Clean Cure	Dirty Cure	Total Cure (Clean+Dirty)	Dirty % of Total
Average	5.1%	12.7%	17.8%	71%

5.4.2 Probability of Default Analysis

In order to determine default flows in the model, BlackRock analysed historical rating migration data and developed regression-based PD models. The PD analysis consisted of the following key steps:

1. Historical ratings data onboarding
2. Due diligence of Bank rating processes and key performance field definitions
3. Mapping individual Bank rating scales to a consistent master scale
4. PD estimation based on the mapped historical ratings dataset for the clean performing (non-modified) universe
5. Overlays to derive PD forecasts for the modified universe as of the Reference Date

Ratings Data Overview & Due Diligence

As part of the commercial work stream, BlackRock requested quarterly historical ratings data from Group A Banks for the five-year period from June 2008 through June 2013. BlackRock requested the full borrower universe at each point historically, including any borrowers that may have exited the dataset before the Reference Date due to pay-offs / write-offs. This was done to avoid possible sample bias in the PD estimation. The Figure below summarises the final historical rating submissions by each Bank.

Figure 94: Historical Ratings Submissions by Bank[39]

Bank Name	Data Start Date	Data End Date
Alpha	Q4 2006	Q2 2013
Eurobank	Q4 2006	Q2 2013
NBG	Q2 2008	Q2 2013
Piraeus	Q4 2006	Q2 2013

As part of the data onboarding process, a number of checks were performed on the files including reconciling borrower IDs to the exposure tape and confirming that the historical ratings tape had sufficient portfolio coverage as of the Reference date. BlackRock confirmed consistency of each Bank's rating system based on a ratings transition analysis which verified that worse credit quality ratings are generally associated with higher transitions to default (i.e., that observed default transitions are monotonic). In addition, BlackRock analysed the evolution of the rating distribution to ensure continuity of rating coverage through time. This analysis identified a discontinuity in the historical rating distribution of Piraeus, which was acknowledged by the Bank and rectified through a resubmission of the historical ratings data tape.

In parallel to the on-boarding of historical ratings data tapes, BlackRock engaged in discussions with management in order to ensure an understanding of Bank rating processes and definitions of key performance fields. A key part of the assessment was to confirm that the default rating provided in the historical data tapes correctly captured the standard default definition of 90+ DPD or unable to pay. This analysis showed that default ratings provided by Eurobank were significantly understating the 90+ DPD flag. Following discussions with the Bank, it was clarified that the default rating provided by the Bank represented legal status (i.e., denounced loans), which was understating observed transition to default. In order to account for this, BlackRock requested historical 90+ DPD data series from Eurobank and combined rating and 90+ DPD data to adjust the default definition in the historical datasets for the purposes of PD estimation. The remaining Banks confirmed that a default rating was automatically assigned to an exposure at 90 DPD. This was confirmed by analysing DPD distribution across performing / defaulted ratings.

Another focus area was to understand the ratings integration process applied to recently acquired entities of Alpha and Piraeus. As the acquired entities lacked sufficient historical data to perform a PD analysis, the forecasts were derived based on the data provided by the respective Parent. Alpha confirmed that the entire Commercial portfolio of Emporiki had been re-rated through the Alpha Credit Committee process and that ratings were assigned in line with the Alpha ratings scale in Q2 2013. Emporiki exposures comprised approximately 30% of the Alpha portfolio as of the Reference Date.

Piraeus did not have sufficient time to re-rate the acquired portfolios through the Piraeus Credit Committee process prior to data submissions. As a result, the Bank mapped the acquired entities' rating scales to Piraeus' 23-point grade master scale based on observed default transitions in the historical data provided by each acquired entity (in some cases, only a few periods of observations were available for the mapping exercise). BlackRock reviewed the mapping provided by Piraeus and considered it appropriate given the limited information available from the acquired entities. The acquired entity portfolios comprised approximately 50% of the Piraeus' notional balance as of the Reference Date. However, the rating-based PD analysis applied only to 49% of the acquired entities portfolios as approximately 51% were in default as of the Reference Date.

Ratings Master Scale Creation

In order to standardise rating models across Banks and to increase the estimation sample size, BlackRock mapped all Bank internal rating scales to a 16-notch master rating scale by matching the observed historical default rates of internal ratings across Banks to a master scale through the "Connecting PDs" shown below.

[39] Eurobank data prior to Q1 2009 was provided on a quarterly basis for delinquency data and semi-annually for ratings data

The mapped ratings were used to differentiate relative credit quality across exposures.

Figure 95: Master Rating Scale Mapping[40]

Master Rating	Connecting 1-Year PD	NBG	Eurobank MRA	Eurobank NCR	Eurobank MRA Large	Eurobank NCR Large	Alpha	Pireaus
R_01	0.40%		1		1,2		AA, A+	1,2
R_02	0.50%	1				1	A	3
R_03	0.80%	2	2		3	2	A-	4
R_04	1.20%	3,4	3		4		BB+	5,6
R_05	1.80%	5		1		3	BB	7
R_06	2.70%	6	4	2	5	4	BB-	8
R_07	3.90%	7,8			6		B+	9,10
R_08	5.70%	9	5	3	7	5	B	11
R_09	8.30%	10,11	6	4		6	B-	12
R_10	11.90%	12			8	7	CC+	13,14
R_11	16.80%	13	7	5	9		CC	15
R_12	23.10%	14,15	8	6		8	CC-	16
R_13	31.00%	16				9		17
R_14	40.10%	17	9	7			C	18,19
R_15	50.00%	18,19		8,9			C-Rstr	20,21
R_Def	100.00%	20, 21, 22	10	10	10	10	D0, D1, E	22, 23

It is important to note that Connecting PDs were used for mapping purposes only and may therefore not be in line with model default forecasts over time, which are affected by future macroeconomic scenarios as well as amortisation assumptions in the model.

PD Estimation

BlackRock made several adjustments to the historical data-set before running the PD estimation. In order to increase consistency across Banks, BlackRock used 5 years of historical data from Q2 2008 to Q2 2013 to derive PD estimations. To strip out any estimation biases caused by modifications, BlackRock also filtered out all observations for rescheduled loans as flagged in the 30 June 2013 data set by the Banks before deriving PD model estimates (note that Alpha did not provide a rescheduled flag for the entire Commercial portfolio). In addition, only the first occurrence of default was considered for each loan, so observations following a restructuring event were consequently excluded from the estimation process

Using the adjusted historical ratings dataset, BlackRock developed a logistic regression-based PD model. The PD model forecasts future transitions to default over different time horizons given a starting rating, year-over-year change in unemployment and an ”interaction” variable between rating and time since rating. The historical dataset allowed BlackRock to derive a probability of moving to default for each rating category over different time horizons. The time-variant forecast is achieved through an interaction variable between rating and time-since-rating included in the regression, which reflected a decreasing predictive power of the starting rating as the forecast moves further into the future. Specifically, a negative sign for the interaction variable implies increasing projected marginal defaults for higher credit quality ratings and declining marginal defaults for lower credit quality ratings. This reflects credit burnout for lower credit cohorts defaulting in the short term as the loans that “survive” show improving performance. Separate PD models were estimated for the SME and the Non-SME universe. Bank dummy variables were also included in order to account for idiosyncratic risks across banks. The key model factors along with the corresponding signs of correlation are listed below.

[40] Connecting PDs shown in the second column of the mapping table are indicative of the lower end of the PD range used for mapping purposes

Figure 96: Top Model Factors

Variable	Sign of Correlation
Rating	+
Unemployment Four-Quarter Change	+
Rating * Time Since Rating	-

For the purposes of estimation, the logistic function must be linearised in the parameters. The logit is formed by applying a natural logarithm to an odds ratio:

$$Logit = \ln\left(\frac{\mathbb{P}}{1-\mathbb{P}}\right) = \alpha + \beta' X$$

The logit links the independent variables with the dependent variable, which in the case of PD estimation, projects whether or not a loan defaults. The default probability for loans at given points in time is retrieved from the logit equation, by entering values for the independent variables:

$$\mathbb{P} = \frac{1}{1+\exp\{-(\alpha+\beta' X)\}}$$

PD Forecasts for the Starting Modified Universe

BlackRock applied overlay adjustments when forecasting PDs for Modified loans. This approach was informed both by due diligence session findings and by an analysis of modification data provided by the banks.

Adjustment for Day 0 Rescheduled Loans

BlackRock applied a rating adjustment for Day 0 rescheduled loans, as due diligence sessions and loan file review findings suggested that, in many cases, reschedulings were performed before an event of default and therefore may not have triggered a change of rating. Given these findings, BlackRock assigned a rating floor of R_13 (on a scale of R_1 to R_15 where R_15 represents the worst performance bucket before default) to rescheduled loans. In other words, all rescheduled borrowers with ratings better than R_13 across Banks were lowered to R_13, whereas ratings worse than R_13 remained the same. In addition, an Alpha-specific adjustment was made in order to account for the fact that the Bank did not provide a rescheduling flag in the 30 June 2013 loan data tapes. Specifically, the entire portfolio rating distribution was notched down to provide a loss impact commensurate with the impact of the rescheduled rating floor as described above for the other Banks.

Adjustment for Day 0 Restructured Loans

BlackRock also made a rating adjustments for Day 0 Restructured loans, given inconsistencies identified in the definition of restructured flags across Banks (e.g., "Restructured at any time in the past" vs. "Currently under a restructuring"). Specifically, all exposures that had a default rating at any point in the last 5 quarters, but had a performing rating with no restructuring flag as of the Reference Date were marked as "restructured". This was a conservative adjustment to capture the universe of recently restructured loans, given that a portion of this prior-defaulted category may have fundamentally cured. In order to adjust for the higher probability of restructured loans to re-default, they were assigned an R_15 rating across all Banks (the worst non-defaulted rating on the master scale). The assignment of all restructured loans to the R_15 category was also supported by an analysis of re-default rates on restructured loans, where 35-45% of loans restructured in 2012 had been in default as of 30 June 2013 (see figure below). It also ensured consistency with Alpha, which had all Restructured loans assigned to the lowest performing internal rating category preceding default.

Figure 97: Re-default Rates on Loans Restructured in 2012

Bank	Restructured in 2012 (Funded EUR MM)	% Defaulted as of 30 June 2013
Total Average	1,679	43.0%

5.4.3 Loss Given Default

This section describes how realised loss is determined for each default flow projected by the model. BlackRock's Loss Given Default approach consisted of a fundamental collateral value analysis based on the collateral data tapes submitted by the Banks, complemented by unsecured/secured "recovery floor" assumptions. Fundamental collateral analysis consisted of the following key steps:

1. Collateral data on-boarding and linkage to loan tapes
2. Rebasing values to the Reference Date
3. Applying forward-value adjustments for real estate collateral to the assumed time of loss realisation
4. Applying liquidation haircuts
5. Assigning realisable value to borrower exposures

The resulting recovery for each borrower was compared to the asset-class specific recovery floors, and the higher of the two values was used as the recovery assumption for the borrower in the model. Different recovery floors were used for unsecured exposures. The following diagram summarises this process, with each component described in more detail below.

Figure 98: BlackRock Approach to LGD Analysis[41]

Collateral Data On-boarding and Linkage to Loan Tapes

The collateral data on-boarding process involved a series of focused discussions and RFI submissions to the Banks in order to ensure a comprehensive understanding of the collateral data environment at each institution. A few specific steps involved in the data on-boarding process are listed below:

- Produced a stratification of key collateral data fields provided in the data tapes
- Mapped "raw" collateral types provided by the Banks to consistent categories across Banks for modelling purposes (the final list of collateral types are shown further in this section)
- Shared the derived mapping with the respective Banks to confirm that it correctly represents their portfolio, and incorporated Bank feedback, where appropriate
- Reconciled collateral balances by collateral type with the Banks
- Analysed collateral data tape structure on a case-by-case basis in order to ensure that collateral value was not double-counted in cases where the same value was repeated for different borrower IDs
- Made bespoke syndication adjustments for each Bank / entity (e.g., rules differed across the acquired Banks at Piraeus). The main objective was to understand if the full value of collateral available to the Syndicate was recorded in the collateral data tapes or if the value was adjusted to the pro-rata share of the syndicated loan exposure held by the Bank. Bank responses to these questions were sense-

[41] While Section 5.4.3 is specific to Corporates, the LGD methodology applies across all Commercial asset class types including CRE, Factoring, SME, Leasing, Shipping (Ferry and Specialised), Public (State 1a & 2)

checked, including a review of a sample of loans against the Large Loan file review process to identify inconsistencies.

- Confirmed collateral currency for each data tape – some Banks provided values that were already converted to EUR, whereas in other cases BlackRock had to make the adjustments
- Determined linkage between loan and collateral data tapes. Collateral with non-zero value in the collateral tapes was compared with the exposures flagged as "secured with tangible collateral" in the loan data tapes. As a result of this reconciliation process, some examples of exposures flagged as "secured with tangible collateral" were identified where only guarantees were available in the collateral data tape. In such instances, exposures were re-classified as unsecured for loss forecasting purposes.

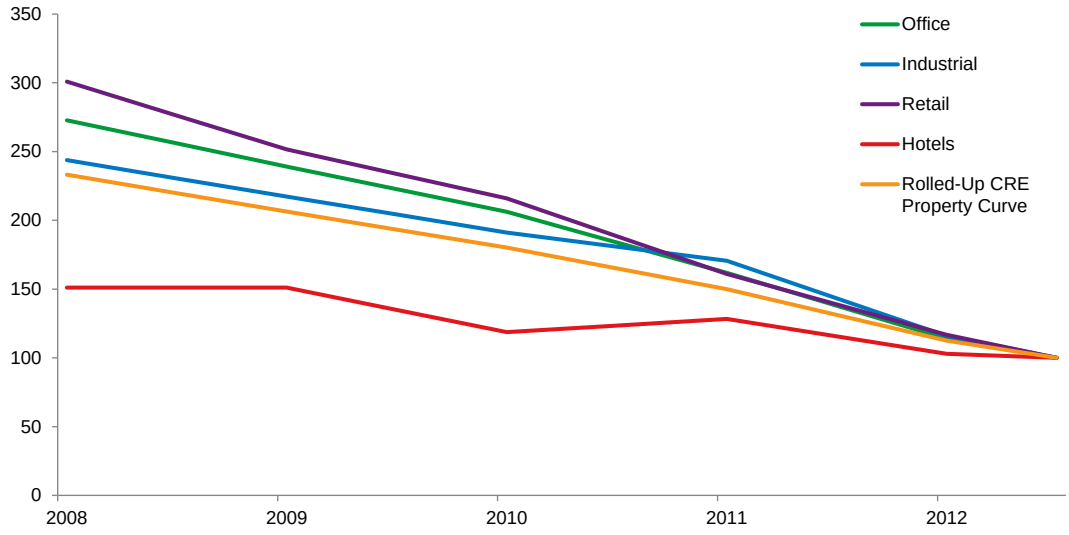
The total gross collateral value for the Commercial Portfolio based on Group A Bank valuations excluding personal and corporate guarantees and excluding shipping collateral amounted to EUR 103.8 BN as of the Reference Date.

BlackRock rebased real estate-related collateral values from the date of last valuation provided by the Bank to the Reference Date. This consisted of two components:

- Index value rebasing
- Valuation adjustment based on a sample-based collateral valuation exercise

For commercial real estate valuations, BlackRock engaged NAI Hellas (NAI"), a member firm of the international property advisor NAI Global with a strong local presence in Greece. NAI provided actual historical changes in value, rents and yields from 2008 to 2013 across all property types (residential, office, retail, industrial, shopping centres, land and hotels) and across various property sub-markets (Athens, Thessaloniki, Islands and Mainland), segmented into prime and secondary locations and different grades of quality and age Vendor provided property value curves are shown below.

Figure 99: Historical Vendor Provided Property Type Curves (Indexed to 100 in June 2013)



Based on the vendor-provided curves, BlackRock created a single curve incorporating the historical data points for each property type, class and market to inform the rebasing exercise. BlackRock used this curve to rebase commercial real estate values within the LGD model, as consistent and accurate property type and market level data was not available in the collateral dataset provided by the Banks.

Group A Banks gross values of tangible collateral of EUR 105.0 BN were rebased to a Reference Date value of

EUR 87.5 BN. The rebasing adjustment only impacted the CRE, land, and residential real estate categories.

BlackRock then tested these rebased values for potential biases by comparing the indexed values to actual desktop valuations of a sample of properties.

Collateral Valuation Review – Process Summary

BlackRock engaged Cushman & Wakefield ("CW") and NAI to perform a desktop valuation of a sample of 406 properties in order to inform collateral haircuts in the Commercial and SBP models as well as to support the Large Loan underwriting exercise, SME loan file review and SBP loan file review. The selected sample included properties across various asset classes (residential, land plots, hotels, industrial, office, retail, farms, etc.) and across various regions of Greece. The majority of the assets were located in the Attica region, given the high concentration of Bank loan collateral in this region. CW and NAI conducted desktop valuations to provide BlackRock with the current market value based on prevailing market conditions. Both valuation agents provided BlackRock with key characteristics related to the collateral properties including property type, location, rental rates, yields, strengths and weaknesses, rent and sales comparables and other key metrics to help inform views on collateral quality.

Property valuations were rebased using market and property type curves aligned with the qualitative information obtained from the valuation agents. After rebasing the Bank-provided collateral valuation to the current market, the valuation provided by CW or NAI was compared to calculate the implied over or undervaluation amount. BlackRock removed extreme outliers and reconciliation errors from the sample in order to ensure the accuracy of the analysis.

BlackRock selected a sample of Commercial real estate properties to value from both Corporate and CRE Large Loan underwriting as well as SME and SBP LFRs. Each valuation received from the external valuation agents was reviewed internally by BlackRock to assess the appropriateness of the valuation agent's methodology and to ensure quality control. BlackRock had to remove some portion of the sample due to misidentification of the collateral to arrive at a revised, smaller sample of 315 in total. An overview of the CRE collateral sample by bank and property type is detailed in the Figure below, pre and post exclusions.

Figure 100: CRE Collateral Sample Count by Bank and Property Type (pre and post exclusions)

Property Type	Alpha	Eurobank	NBG	Piraeus	Total
Industrial					
Prior to Exclusions	15	9	19	28	71
After Exclusions	10	9	15	20	54
Land					
Prior to Exclusions	3	4	2	41	50
After Exclusions	2	3	1	23	29
Lodging					
Prior to Exclusions	6	5	0	19	30
After Exclusions	3	5	0	16	24
Multifamily Residential					
Prior to Exclusions	2	1	0	0	3
After Exclusions	2	1	0	0	3
Office					
Prior to Exclusions	17	13	10	11	51
After Exclusions	10	13	7	8	38
Other					
Prior to Exclusions	23	8	12	38	81
After Exclusions	19	8	12	33	72
Retail					
Prior to Exclusions	29	12	4	26	71
After Exclusions	20	7	3	20	50
Warehouse					
Prior to Exclusions	10	13	13	13	49
After Exclusions	8	13	11	13	45
Total					
Prior to Exclusions	*105*	*65*	*60*	*176*	*406*
After Exclusions	*74*	*59*	*49*	*133*	*315*

Based on the results of this review, BlackRock made an 8% downward adjustment to CRE property values across banks to account for differences between sample-based real estate collateral valuations and Bank-provided valuations rebased to the Reference Date.

For residential real estate valuations, BlackRock used a property index provided by Bank of Greece to rebase internal Bank values based on results of the residential drive-by exercise. Please refer to Section 2.4 for more details on this process.

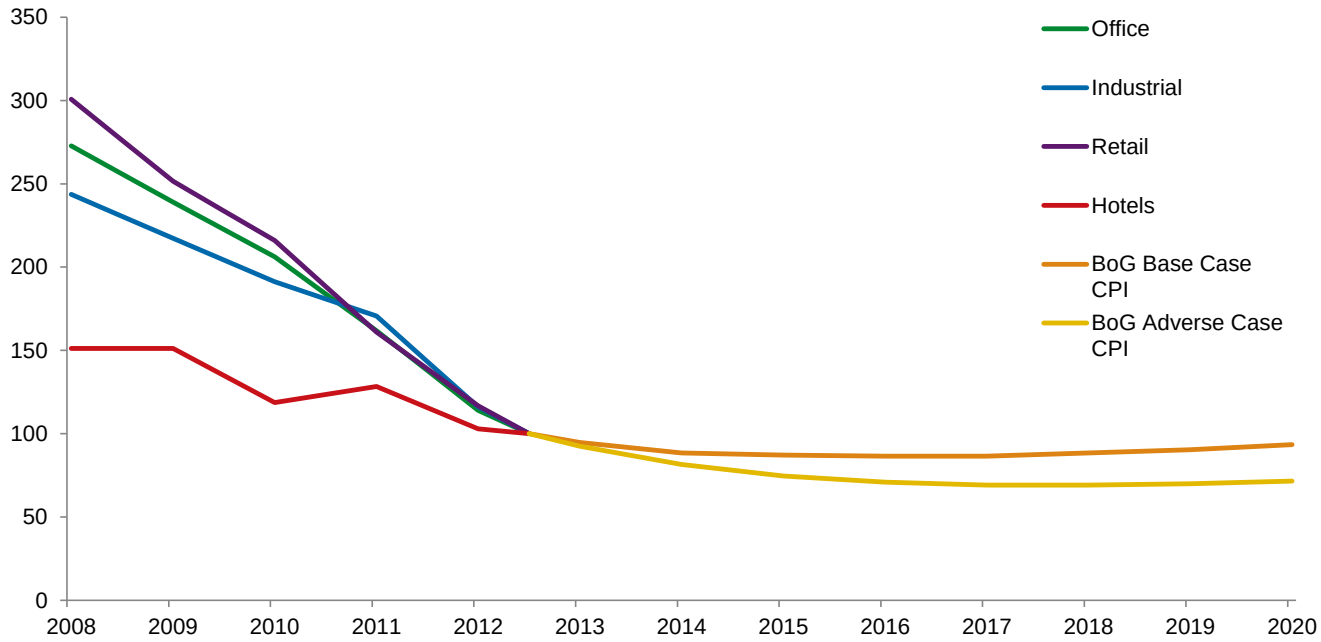
Forward Value Adjustments and Recovery Timelines

BlackRock differentiated recovery lag assumptions by collateral type in order to account for differences in collateral liquidity and associated recovery timing.

Illiquid Collateral (Real Estate)

Illiquid assets consisted primarily of commercial and residential real estate, whose valuations were dependent upon forward value curves provided by the Bank of Greece, shown below.

Figure 101: Forward Valuation Curves provided by Bank of Greece vs. Vendor Provided Curves (Indexed to 100 in June 2013)



Forward commercial real estate projections appear to be conservative, with an aggregate decline in value of 7% in the Base Case from the end of 2013 through 2018 and a corresponding 25% decline in the Adverse Case. CRE valuations decline in the near and medium term when marginal PD rates projected by the model are the highest. This adds a layer of conservatism to the loss estimates as valuations continue to decline through 2018 in the Base Case and 2019 in the Adverse Case.

In terms of recovery delays, real estate collateral types exhibit a relatively longer workout time in the current legal framework. BlackRock informed assumptions on recovery lag for property based on information obtained during due diligence meetings, consultation with Greek legal counsel and auction data obtained from the Banks. BlackRock assumed real estate assets would be realised with a 5-year lag from initial default, with collateral values moving along the curve to the assumed future time of realisation, therefore taking into account any projected value changes based on the real estate index forecasts.

Liquid Collateral

Collateral assets deemed to be liquid for the purpose of the recovery timing assumptions included Cheques, Cash, Securities, and State Receivables. BlackRock expected these collateral types to require on average 2 years from default to cash recovery by the Bank. This 2-year assumption was based on Bank due diligence meetings, and incorporates a time lag between a default event and movement to legal as well as an additional lag to recover collateral value.

For exposures already in default as of the Reference Date, the recovery timeline calculation also takes into account the "age" of default (based on DPD and legal status). Specifically, remaining time for day 0 defaulted exposures is calculated as the difference between recovery lag assumptions described above minus "age" of default.

Collateral Haircuts

BlackRock assigned haircuts on tangible collateral (i.e., real estate, receivables and inventory, cash and cash-like financial instruments) which could be liquidated in a borrower event of default, and used a number of information sources to assess the quality of the collateral valuations presented by the Banks. Information

sources included Bank documentation and manuals, due diligence meetings, market intelligence, discussions and research provided by external advisors, collateral valuation review and detailed reviews of loan files selected for the LFR and Large Loan underwriting processes. The following table provides the haircut assumptions used for each type of collateral for LGD assumptions:

Figure 102: BlackRock Collateral Haircut Assumptions

Collateral Type	Base Case Collateral Haircut	Adverse Case Collateral Haircut
Accounts Receivable / Inventory	50%	60%
Cash / Cash Deposits	5%	10%
Cheques	10%	20%
Commercial Real Estate	38%	38%
Guarantee	100%	100%
Land	35%	35%
Other	30%	40%
Residential Real Estate	*Please see Section 2.4*	
Securities	30%	40%
Ships	10%	15%
State	0%	0%
State-Related Recievables	0%	0%

Specific assumptions were made on the recoverability of the collateral:

- State-Related receivables or guarantees were assumed to be fully recoverable based on the assumption provided by the Bank of Greece.
- Cash was assumed to be mostly recoverable with 5% and 10% haircuts in the Base and Adverse Cases, respectively. This was a conservative assumption based on conversations with the Banks.
- Haircuts on post-dated cheques were 10% and 20% in the Base and Adverse Cases, which is in line with information received from the Banks on recoverability of post-dated cheques given default
- Accounts Receivable and Inventory were given a haircut of 50% and 60% in the Base and Adverse Cases to reflect views developed during Large Loan underwriting and SME loan file reviews
- For personal and corporate guarantees, a haircut of 100% was applied. Value was assigned separately through a BlackRock recovery overlay to the LGD assumptions, as further described below.
- The Residential real estate haircut derivation is described in the Residential Mortgages methodology Section 2.4
- The Commercial real estate collateral haircut of 38% was derived based on sample-based collateral valuation review. Note that the 38% haircut includes the overvaluation adjustment as described above which is based on a comparison of re-based bank collateral values as of the reference date to values derived through a desktop valuation exercise. See the *Commercial Real Estate Haircut Derivation* sub-section below for more detail.

Rebased collateral values for Group A Banks of EUR 87.5 BN were further adjusted by applying collateral haircut assumptions (as outlined in Figure 102 above). The post-haircut collateral values for the Group A Banks amounted to EUR 58.2 BN for the Group A banks equivalent to 55% of gross collateral values of EUR 105.0 BN pre-rebasing and pre-haircuts.

Personal and Corporate Guarantees were assumed to provide value in the way of a litigable deficiency claim. For Secured exposures, BlackRock assumed that personal and corporate guarantees would provide an additional recovery of 5% of the loan balance in the Base Case and 3% in the Adverse Case above the recovery obtained from the current collateral position. For unsecured exposures, no additional credit was given for guarantee recovery – it was taken into account when deriving the unsecured recovery floors (described in the "*Assign Realisable Value to Loan Exposures"* sub-section below*)*

Commercial Real Estate Haircut Derivation

Based on the collateral valuation process described above, BlackRock derived the overall CRE haircut referenced in the figure above, which informed Commercial and SBP credit loss forecasting models. Specifically, the haircut was derived as follows.

Liquidation Haircut = Re-based Bank Market Value x (1 – Overvaluation Discount) x (1 – total expected liquidation, enforcement costs, and preferential claims)

For example and as mentioned above, the value of a commercial real estate property (after rebasing to the reference date based on a historical index curve), varied by Bank but was haircut by 8% on average to account for the estimated Bank overvaluation. It was then further haircut by 30% to account for additional liquidation expenses associated with enforcing claims against the borrower, retiring preferential claims and prior encumbrances and realising cash recovery. The haircut of 38% is maintained throughout time as collateral valuations move with the forward value curves provided by the Bank of Greece in order to anticipate future growth or decline in market value.

BlackRock did not assume a forced sale discount, as Banks are expected to execute sales at market value, rather than liquidate prematurely at large discounts.

Assign Realisable Value to Loan Exposures

Following the comprehensive collateral analysis and adjustments described in this section, BlackRock carried out the following steps to assign recovery values to borrower exposures:

1. Calculated realisable collateral value through rebasing and applying forward valuation curves to collateral, if applicable, and applying liquidation haircut assumptions
2. Collateral value was capped at Borrower EAD in order to avoid sharing overcollateralisation amounts across different borrowers in a portfolio
3. Added a recovery credit of 5% in Base Case and 3% in the Adverse Case to give credit for potential recoveries from personal and corporate guarantees, which were informed through due diligence sessions with the Banks both during the AQR and TAR processes
4. Compared the resulting recovery amount from the above steps to the asset-class specific recovery floors, shown in the tables below. Recovery was increased to equal the floor amount if it was below the floor.

Figure 103: Recovery Floors for Secured Loans

	Corporate / CRE / Leasing / Factoring	SME/Leasing	Shipping (Ferry & Specialised)	Public (State 1a & 2)	State 1b (e.g., TEMPME)
Base Case	40%	25%	40%	100%	80%
Adverse Case	30%	15%	30%	100%	80%

For Unsecured exposures, the following floors are applied directly in the model.

Figure 104: Recovery Floors for Unsecured Loans

	Corporate / CRE / Leasing / Factoring	SME/Leasing	Shipping (Ferry & Specialised)	Public (State 1a & 2)	State 1b (e.g., TEMPME)
Base Case	25%	20%	25%	100%	80%
Adverse Case	15%	10%	15%	100%	80%

The secured / unsecured recovery floors were informed by the AQR process, Large Loan underwriting and SME LFR results, which provided insight into recoverability both from available collateral in a liquidation scenario and from a debt capacity assessment against the total outstanding loan amount (and resulting principal modification in an assumed debt restructuring). Benchmarks for recoveries from other jurisdictions were also taken into consideration, keeping in mind the specific characteristics of the Greek market.

5.5 Group B Banks

5.5.1 Portfolio Stratifications

Figure 105: Group B Corporate Loan Portfolio Stratifications[42]

		Aegean Baltic	Attica Bank	Credicom	Panellinia	Probank	Proton (Good Bank)	TT Hellenic Postbank	Total
Portfolio Limits	Funded (€MM)	5	1,094	5	172	813	656	1,010	3,755
	Unfunded Committed (€MM)	0	56	16	0	0	31	21	124
	Unfunded Uncommitted (€MM)	0	0	0	0	31	0	2	34
	Total Limit (€MM)	5	1,150	21	172	844	686	1,034	3,912
Performance Status	Current (%)	100%	83%	100%	63%	89%	28%	67%	69%
	Defaulted (%)	*0%*	*17%*	*0%*	*37%*	*11%*	*72%*	*33%*	*31%*
	90+ dpd (%)	*0%*	*15%*	*0%*	*25%*	*2%*	*5%*	*21%*	*13%*
	Denounced (%)	*0%*	*1%*	*0%*	*18%*	*0%*	*0%*	*0%*	*1%*
Loss Mitigation	Current Modified (0-89 dpd, %)	*0%*	*0%*	*0%*	*28%*	*8%*	*8%*	*10%*	*7%*
	Modified Defaulted (%)	*0%*	*0%*	*0%*	*19%*	*4%*	*4%*	*17%*	*7%*
Security	Secured by Tangible Collateral (%)	*100%*	*54%*	*0%*	*51%*	*63%*	*31%*	*47%*	*50%*
Loan Term	WA Remaining Term (years)	0.4	3.6	0.5	5.5	4.1	0.9	2.1	2.9

5.5.2 Methodology Overview

Credit loss projections for Group B Banks were derived using the same loan-level Commercial models that were used for Group A Banks with key assumptions informed based on Group A Bank PD and collateral analysis.

Probability of Default

In order to leverage the PD model developed based on the Group A Bank historical ratings data, BlackRock mapped Group B Bank ratings to the Group A Bank Master Rating scale. The mapping was based on rating scale description, implied PDs by rating, and rating transition matrices provided by each Bank, where

[42] BlackRock used the following definitions for the Performance Status field: Defaulted is defined based on a combination of default flags from the data tapes, crossed at the borrower level; 90+ is defined as in arrears of 90 DPD or more; Denounced is defined as in legal status.

available. Once the ratings were mapped to the master scale, model coefficients derived from Group A data were applied to Group B exposures.

An additional adjustment applied to Group B Banks related to the asset class segmentation between Corporate and SME balances. During due diligence sessions with Group B Banks, BlackRock observed that some Banks had a generic "Corporate" portfolio, without splitting out SME and Corporate asset classes, even though smaller average loan balances and discussions during Group B due diligence sessions suggested that most of the exposure is in fact comparable to Group A Bank SME portfolios. Based on these findings, BlackRock applied a balance-based rule to re-classify Corporate borrowers with funded balances less than EUR 2.5 MM to the SME asset class, and therefore ran the loans through the Group A SME PD model.

Loss Given Default

BlackRock adopted a two-step methodology to derive Loss Given Default assumptions for Group B Banks. First, BlackRock identified loans with tangible collateral using a combination of the secured flags in the loan data tape and the collateral data tapes provided by each Group B Banks. Secondly, BlackRock derived recovery assumptions for the secured and the unsecured segments of the Group B universe

The secured recovery assumptions were informed based on the average observed recovery (1 - LGD) on the secured portion of each asset class for the Group A Bank universe. Unsecured assumptions were in line with Group A Bank unsecured recovery floors.

Large Loan Overrides

In addition to the PD/LGD model methodology, BlackRock further refined the credit loss projections across the Group B Bank universe by leveraging the Group A large loan underwriting process. This was achieved by identifying the underwritten large loan credit exposure within Group B banks and extending Group A loss estimates accordingly, provided that Group B bank's position had the same security and rank. As a result, BlackRock underwriting team applied name-level losses to 14 Group B loans corresponding to a funded balance of EUR 457 MM. The majority of this exposure was concentrated in Attica and TT.

Merchant Shipping – Aegean Baltic Bank

Given the specialised nature of Aegean Baltic Bank's business model focused exclusively on Shipping, the exposures of this Bank were modelled through the deterministic cash-flow based Merchant Shipping framework, in line with the method used for Group A Banks. For further detail on Shipping methodology, see Section 6.4.

Shipping Loans

6.1 Scope of Asset Quality Review

As of 30 June 2013, the funded balance of Shipping loans totalled EUR 8.5 BN across Group A Banks and EUR 366 MM across Group B Banks. The purpose of the AQR was to provide an assessment of the assets held by each Bank and to gather qualitative information regarding Banks' lending practices, portfolio monitoring, and workout procedures. BlackRock assessed Shipping loan asset quality through the following processes:

- Conducted management due diligence sessions to review and discuss Bank history, product types, origination strategy, portfolio performance, loss mitigation practices, and collateral valuation and recovery efforts
- Reviewed loan-level and collateral-level portfolio data for Group A and Group B Banks as of 30 June 2013
- BlackRock Shipping specialists manually reviewed a sample of 24 Large Loan[43] exposures totalling EUR 1.6 BN held at the Group A Banks to provide confirmatory due diligence and inform model assumptions, such as the liquidation haircut
- Conducted research and consulted external sources in order to inform model projections and calibrate models, where necessary. For example, BlackRock obtained third-party projections from industry experts for ship values and charter rates to inform vessel cash flows and future collateral values

These qualitative and quantitative factors served as inputs to inform BlackRock's deterministic model developed to generate Shipping CLP results as described in Section 6.4 of this report.

The due diligence process for Group A Banks included an original RFI sent to each Bank prior to management due diligence sessions, loan-level data requests, and follow-up RFIs, as necessary. The Shipping RFI covered the following main areas:

- Lender profile and organisational history
- General product features and portfolio stratifications
- Origination and underwriting strategies
- Credit review and monitoring processes
- Payment collections
- Loss mitigation strategies
- Credit performance projections
- Collateral valuation frequency; assessment of personal or corporate guarantees
- Collateral liquidation strategies and history of recovery practices
- Level of sponsor support
- Shipping loan ratings models
- Status of any merger integrations, including the effects on banking practices and data systems

Two day-long due diligence sessions were held with management teams at each Group A Bank to cover all Commercial asset classes, while one-day due diligence sessions were held to discuss both Retail and Commercial asset classes at the Group B Banks. In addition to the above listed RFI topics covered during management presentations, BlackRock also requested the following specific documentation to be submitted by each Group A and Group B Bank for all Shipping loans:

[43] This sample is in addition to the 128 underwritten Corporate, CRE and State Related borrowers.

- Detailed loan-level data submission
- Product type descriptions
- Detailed summaries of the Shipping loan portfolio by various risk metrics
- Loan underwriting and credit approval documentation
- Schedule of historical payment status
- Bank organisational structure for Shipping loan underwriting, loan servicing, and payment collection department
- Descriptions of modification options used for Shipping loans
- Description of restructuring, workout, and loss mitigation strategies

If any information was unclear or incomplete from the due diligence sessions or data submissions, BlackRock submitted written follow-up RFIs, exchanged emails with relevant Bank employees, and held follow-up calls, where necessary.

6.2 Portfolio Stratifications and Risk Analysis

Data Collection and Review

In order to obtain an accurate and comprehensive understanding of the exposures held across the Banks, BlackRock used the standardised loan-level data template developed for Corporate loans (as further described in Section 5.2 and added additional collateral-level fields tailored to Greek shipping loans, which included:

- Vessel IMO (a unique internationally accepted identifier for motorised vessels)
- Vessel name
- Vessel type (e.g., dry bulk carrier, containership)
- Vessel sub-type (e.g., oil, product, chemical, LNG, LPG)
- Vessel cargo capacity in appropriate units (e.g., deadweight tons, twenty-foot equivalent units)
- Vessel size (e.g., handysize, panamax)
- Latest vessel valuation
- Date and source of latest vessel valuation
- Vessel original delivery date
- Country and yard where vessel was built
- Vessel employment information, where applicable, including: type of charter, charterer name, day rate, charter status (time, spot, bareboat, other), charter start and end dates
- Vessel daily operating expense
- Loan balloon payment date, where applicable
- Loan balloon payment amount, where applicable

Data Preparation

Upon receipt of Bank submissions, BlackRock downloaded and on-boarded the datasets to a database system, which facilitated the organisation and standardisation of data across various output formats (i.e., .txt, .xls, etc.). This process allowed for the creation of portfolio stratifications, data gap reports, and the implementation of data overrides and assumptions. The original data submissions by the Banks varied in the level of completeness, and over the course of several weeks, BlackRock and the Banks engaged in a comprehensive data reconciliation process.

BlackRock produced detailed stratification tables in a standard format and compared these tables to summary tables provided by each of the Banks to confirm balances and other key risk factors. This process allowed the Banks to acknowledge that the data supplied to BlackRock was consistent with the Banks' own understanding of their respective portfolios. Inconsistencies were addressed via iterative data re-submissions, email correspondence, teleconferences, as well as in-person meetings. Reconciliations of differences were performed subject to materiality and to the extent practical, within the limited timeframe during which the analysis was conducted.

BlackRock classified ship collateral into categories defined by ship type, size and vintage and as shown in the Figure below. Then, BlackRock linked each facility to the collateral and consolidated facilities by borrowers in cases where multiple facilities are cross-collateralised by multiple ships.

The shipping categories used by BlackRock were:

- Dry Bulk Carriers
- Crude Tankers
- Product Tankers
- Chemical Tankers
- Containerships
- LNG Carriers
- LPG Carriers
- Specialised (includes, among others, ferries, cruise boats, yachts, roll-on / roll-off vehicle and passenger carriers, reefers, and oil-related vessels)

Major ship types were further classified into sub-categories based on size or cargo type, as shown in the figure below:

Figure 106: Shipping Sub-Types

Dry Bulk Carrier	Handysize Handymax Panamax Capesize	Containership	1000 TEU 1700 TEU 2000 TEU 2500 TEU 4300 TEU 6500 TEU 8300 TEU 10000 TEU
Crude Tanker	Panamax Aframax Suezmax VLCC		
Product Tanker	Product Small Product Medium Product LR1 Product LR2	Gas Carrier	LNG LPG

For the Group A Bank merchant fleet, BlackRock analysed (i) extensive historical ship valuation and charter rate data; (ii) operating expense information provided by the Banks and cross-referenced against BlackRock's external research; and (iii) current and forward ship valuation curves provided by reputable research providers in the shipping industry, in order to benchmark current and forward valuations and operating income for each vessel financed.

Portfolio Overview and Summary Statistics

The Group A Bank Shipping universe encompassed EUR 8.5 BN of funded balances as of 30 June 2013. Piraeus had the largest share of Shipping exposure with EUR 3.6 BN in total funded balance, representing approximately 43% of the total Group A Banks funded balance. Eurobank was the smallest constituent, with a EUR 817 MM funded balance, representing 10% of the total.

The Figure below contains an overview stratification of key characteristics and risk metrics of Shipping exposure across the entire Group A Banks universe, relative to the Group A Bank average. It features key risk metrics such as LTV distribution, vessel age and performance status. The collateral valuations used in this chart are the current vessel values determined by BlackRock as further described in this report in Section 6.4.

This stratification process allowed BlackRock to segment the portfolio into risk segments for the purposes of applying specific assumptions to each risk segment in the portfolio for credit loss modelling and analysis.

Figure 107: Overview of Group A Banks Shipping Loan Portfolios [44, 45]

		Alpha	Eurobank	NBG	Piraeus	Total
Portfolio Limits	Funded (€MM)	1,969	817	2,044	3,648	8,478
	Unfunded Committed (€MM)	89	176	3	37	305
	Unfunded Uncommitted (€MM)	0	117	4	2	124
	Total Limit (€ MM)	2,058	1,110	2,051	3,687	8,907
Collateral by Age	0 to 4 years (%)	*24%*	*23%*	*19%*	*20%*	*21%*
	5 to 9 years (%)	*32%*	*15%*	*29%*	*18%*	*25%*
	10 to 14 years (%)	*20%*	*20%*	*15%*	*17%*	*17%*
	15 to 19 years (%)	*13%*	*24%*	*13%*	*20%*	*16%*
	20 to 24 years (%)	*7%*	*12%*	*9%*	*12%*	*10%*
	25+ years (%)	*5%*	*6%*	*14%*	*14%*	*11%*
	Total Collateral (€ MM)	1,501	790	1,964	2,324	6,579
Collateral by Vessel Type	Bulk Carrier (%)	*39%*	*42%*	*40%*	*48%*	*43%*
	Tanker (%)	*46%*	*36%*	*35%*	*27%*	*35%*
	Container (%)	*5%*	*14%*	*5%*	*6%*	*6%*
	Gas (%)	*0%*	*0%*	*2%*	*0%*	*1%*
	Passenger (%)	*9%*	*5%*	*10%*	*13%*	*11%*
	Specialised (%)	*1%*	*2%*	*7%*	*6%*	*5%*
	Total Collateral (€ MM)	1,501	790	1,964	2,324	6,579
LTV Distribution	Less than 75%	*7%*	*38%*	*13%*	*3%*	*9%*
	75 to 90%	*14%*	*18%*	*10%*	*7%*	*10%*
	90 to 100%	*2%*	*7%*	*23%*	*8%*	*10%*
	100 to 125%	*35%*	*22%*	*13%*	*11%*	*18%*
	Over 125%	*41%*	*15%*	*41%*	*71%*	*51%*
	Total Over 100%	76%	37%	54%	82%	70%
Performance Status	Current (%)	*88%*	*99%*	*87%*	*71%*	*82%*
	Defaulted (%)	*12%*	*1%*	*13%*	*29%*	*18%*
	90+ dpd (%)	*6%*	*1%*	*9%*	*14%*	*10%*
	Denounced (%)	*0%*	*0%*	*1%*	*2%*	*1%*
Loss Mitigation	Current Modified (0-89 dpd, %)	*0%*	*2%*	*2%*	*7%*	*4%*
	Modified Defaulted (%)	*0%*	*0%*	*2%*	*4%*	*2%*
Loan Term	WA Remaining Term (years)	NA	4.2	5.5	5.5	5.3

- The aggregate percentage of defaulted balances across all Group A Banks was approximately 18%, while loss mitigation was performed on 6% of the total universe.
- The dry bulk and tanker sectors represented approximately 78% of the total vessel collateral (by value) of the Group A Banks.
- 79% of exposures across the Group A Banks had LTVs in excess of 90% and 51% of exposures had LTVs in excess of 125%. Piraeus has the highest weighted average LTV and the largest % of exposures with LTVs in excess of 90%. Eurobank was the lowest across both metrics. LTV is a key driver of loss severity.
- Piraeus had the largest percentage of loss mitigation performed to date. However, it is important to note that loss mitigation definitions and tracking policies are not entirely consistent across Banks. For example, it is important to note the following about Alpha's modification statistics:
    - Alpha does not maintain rescheduling information in its systems, which results in a systematic understatement of modified exposure at the Bank
    - While restructuring information is maintained for non-defaulted exposures (via a "Restructured" rating category), the flag is removed as soon as the exposure enters default. As a result, Modified Defaulted exposure is reported at 0%

[44] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

[45] LTV distribution statistics relate to the merchant shipping fleet only (i.e., excluding the passenger ships and specialised vessels).

The Figure below shows the count-wise distribution by vessel type and size for each of the Group A Banks.

Figure 108: Vessel Count by Bank

	Alpha	Eurobank	NBG	Piraeus	Total
Bulk Carrier	**62**	**45**	**125**	**125**	**357**
Capesize	12		20	12	44
Handysize	12	11	20	27	70
Handymax	23	20	26	49	118
Handymax			-	1	1
Panamax	15	14	59	36	124
Containership	**13**	**13**	**17**	**26**	**69**
1000 TEU	1	2	2	1	6
1700 TEU		1	4		5
2000 TEU		2	-	5	7
2500 TEU	6	1	-	6	13
4300 TEU	2	4	8	8	22
6500 TEU	2	2	-	1	5
8300 TEU	2		2	2	6
10000 TEU		1	1	3	5
Gas Carrier	**0**	**0**	**3**	**0**	**3**
LNG			1		1
LPG			2		2
Tanker	**99**	**22**	**108**	**81**	**310**
Aframax	6	2	13	5	26
Panamax	22	4	6		32
Product LR1			10	14	24
Product LR2			4	6	10
Product Medium	35		35	16	86
Product Small	3	6	18	20	47
Suezmax	13	1	8	5	27
VLCC	7	1	3	2	13
Chemical	13	8	11	13	45
Passenger	**37**	**5**	**62**	**51**	**155**
Passenger	37	5	62	51	155
Specialised	**3**	**8**	**48**	**30**	**89**
Specialised	3	8	48	30	89
Grand Total	***214***	***93***	***363***	***313***	***983***

Figure 109: Vessel Count by Age

	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25+	Total
Bulk Carrier	**98**	**84**	**58**	**84**	**21**	**12**	**357**
Capesize	18	17	3	3	3		44
Handysize	10	15	15	23	2	5	70
Handymax	38	19	15	37	4	5	118
Handymax						1	1
Panamax	32	33	25	21	12	1	124
Containership	**20**	**12**	**7**	**15**	**13**	**2**	**69**
1000 TEU		1	1	1	3		6
1700 TEU	2			3			5
2000 TEU				6	1		7
2500 TEU	5	1	1	2	2	2	13
4300 TEU	6	4	5		7		22
6500 TEU	2			3			5
8300 TEU		6					6
10000 TEU	5						5
Gas Carrier	**1**	**2**	**0**	**0**	**0**	**0**	**3**
LNG	1						1
LPG		2					2
Tanker	**74**	**115**	**45**	**30**	**27**	**19**	**310**
Aframax	12	4	3	5	2		26
Panamax	6	19	4	1	2		32
Product LR1	5	2	8	3	5	1	24
Product LR2	1	5	4				10
Product Medium	10	48	9	11	5	3	86
Product Small	16	6	2	6	8	9	47
Suezmax	9	9	6		3		27
VLCC	5	2	4	2			13
Chemical	10	20	5	2	2	6	45
Passenger	**1**	**11**	**50**	**29**	**18**	**46**	**155**
Passenger	1	11	50	29	18	46	155
Specialised	**10**	**19**	**8**	**4**	**15**	**33**	**89**
Specialised	10	19	8	4	15	33	89
Grand Total	***204***	***243***	***168***	***162***	***94***	***112***	***983***

6.3 Large Loan Underwriting

Unlike the Corporate and CRE Large Loans that were underwritten by BlackRock, bespoke credit losses were not projected during the Shipping loan file review process.[46] This is because the deterministic model used to project shipping losses (described further in Section 6.4) is a cash flow based model that projects defaults and losses at the borrower level. The credit file review for Shipping Large Loans focused on:

- Conducting confirmatory due diligence on loan and collateral specific details provided by the Banks in the data tape submissions
- Gaining qualitative insights into the Banks' practices with respect to documentation and management of shipping loans

[46] Bespoke losses were estimated for 3 Greek ferry exposures, which were classified as General Industries and are covered under the scope of Section 5.3

Figure 110: Shipping Loan Underwriting Sample

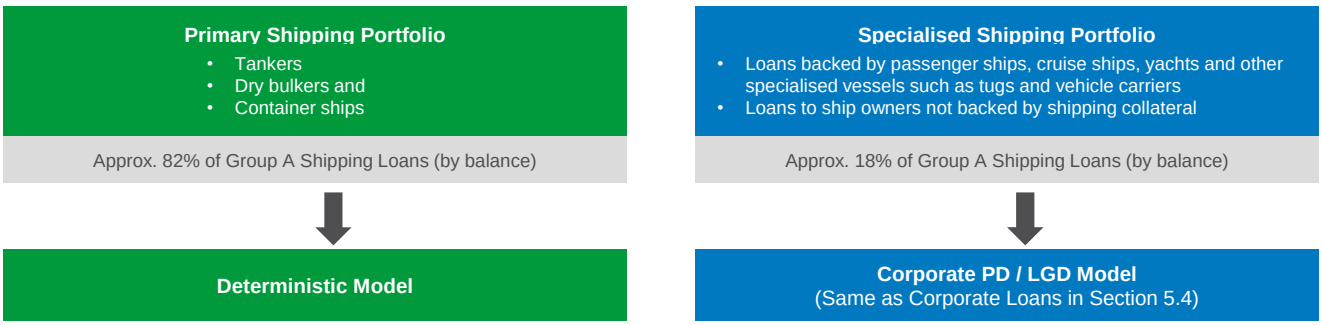
	Loan Files Reviewed		Shipping Large Loan Universe	
	Borower Count	Borrower Balance (EUR MM)	Total Balance (EUR MM)	%Reviewed
Alpha	7	426	1,216	35%
Eurobank	3	119	426	28%
NBG	8	372	972	38%
Piraeus	6	641	2,671	24%
Total	***24***	***1,557***	***5,284***	***29%***

6.4 Modelling Methodology

Overview

BlackRock used two approaches to model shipping-related exposures based on the nature of the exposure. Approximately 82% (by balance) of the Group A Bank shipping portfolio, which consisted of exposures to merchant ships including tanker, dry bulker, containership, liquefied natural gas ("LNG") and liquefied petroleum gas ("LPG") categories, was analysed through BlackRock's deterministic shipping model. The remaining 18% of the portfolio consisted of loans backed by specialised ships including ferries and loans issued to ship owners backed by non-ship collateral. This portion of the portfolio was analysed using the PD/LGD approach used for Corporate loans and is described in detail in Section 5.4.

Figure 111: Shipping Methodology Overview



The Shipping model utilised a deterministic cash flow based methodology to forecast defaults and losses (if any) at the loan level for the portfolio of merchant shipping loans. The model produced loan-level cash flow projections using a combination of charter status, charter rates, charter expiry dates and operating expenses for each vessel. The analysis was further supplemented by current and forward-looking valuations for each vessel.

Third-Party Data

BlackRock engaged third-party shipping market experts to provide estimates of the (i) current values for all vessels according to ship type, size and age, and (ii) one-year time charter rates for the various ship types and sizes. Estimates were provided across Base and Adverse Cases and were based on the macroeconomic projections provided by the Bank of Greece, which in addition to the factors listed in Section 1.4, incorporated China, North America and OECD Europe GDP growth rates.

Methodology

The model projected quarterly cash flows for each vessel in the loan portfolio. For each quarter, vessel-specific cash flows were calculated by subtracting the expected operating expenses from the expected charter revenue. Expected operating expenses were calculated by assuming a 2% per annum growth from their current rate, which is consistent with long-term shipping operating expense inflation rates, based on discussions with established market participants, including the Group A Banks and third-party providers. Operating expenses mainly consisted of crew wages, insurance and maintenance. Fuel costs, which tend to be more volatile, are the charterer's responsibility in a typical time charter, and were thus not included in the operating expense.

The approach to the expected charter revenue calculation was a function of the current charter status. If a vessel was currently on a time charter, then the charter rate was assumed until the charter end date. Beyond the charter end date, BlackRock forecasted the charter rate based on ship type, size and age provided by the third-party specialist. If a ship was currently not on a time charter, then BlackRock assumed forecasted charter rates were applied immediately.

When BlackRock used forecasted charter rates, a haircut of 5% in the Base Case and 10% in the Adverse Case was applied to approximate transaction and/or idle costs. The forecasted charter rates were valid for a given ship type and size up to a ship age of 15 years. For ships older than 15 years, additional haircuts were applied to forecasted charter rates. Specifically, a haircut of 15% was applied to charter rates for ships that are between 15 and 25 years old and a haircut of 50% was applied to charter rates for ships over 25 years old.

BlackRock did not independently evaluate the underlying creditworthiness of the charterers due to the fact that a majority of the existing charterers were unrated. Based on market and industry knowledge, BlackRock assumed a probability of default of charterers of 2% per annum in the Base Case and of 5% in the Adverse Case. The impact of this potential default was captured by reverting the charter rate from the actual rate to the forecasted rate at the time of default. BlackRock modelled this by taking a probability-weighted average of actual charter rates and forecasted charter rates for every quarter during the term of a charter. In addition, to the extent there was more than one vessel securing any loan, the cash flows for such vessel were combined to create cash flows at the "crossed collateral" level.

The collateral cash flows derived using above methodology were then compared with the contractual interest and debt service requirements (i.e., principal plus interest) for each corresponding loan:

- Loan-level interest rates provided by the Banks in the loan tapes were used to calculate interest payments due
- As most amortisation information was inconsistent across the Banks, BlackRock estimated principal payment requirements for each loan using the current balance, balloon payment required at maturity and remaining time to maturity, each of which was provided by the Banks in the loan tapes

A combination of interest coverage ratios ("ICR"), debt service coverage ratios ("DSCR") and loan-to-value ratios ("LTV") was used to determine loan performance behaviour at different points of time during the term of the loan as well as at final maturity. These metrics are defined below:

- $ICR\ for\ a\ given\ quarter = \frac{(Required\ interest\ payment\ for\ such\ quarter)}{Collateral\ cash\ flow\ for\ that\ quarter}$
- $DSCR\ for\ a\ given\ quarter = \frac{(Required\ principal+interest\ \ payment\ \ for\ such\ quarter)}{Collateral\ \ cash\ \ flow\ for\ that\ \ quarter}$
- $LTV\ \ at\ any\ point\ of\ \ time = \frac{(Projected\ \ principal\ balance\ at\ \ such\ time)}{BlackRock\ forecasted\ \ collateral\ \ value\ at\ such\ time}$

Loan behaviour during the term of a loan (i.e., prior to the maturity date) was determined based on ICR and DSCR tests:

- During the first 30 months, if ICR was less than 1.0x, then a loan was considered defaulted. The implicit assumption was that during this period, as long as the cash flows from the vessel are sufficient to cover the interest payments, Banks will not put the loan into work-out
- After the 30 month period, this test switches to a DSCR test. When the DSCR is less than 0.75x, then the loan is considered defaulted

At loan maturity, behaviour was determined based on a combination of LTV and DSCR, as follows. This test could result in three possible outcomes: 1) the loan pays off in full, 2) maturity extension for 2 years or 3) the loan defaults:

- If LTV was less than 90%, then BlackRock assumed the loan pays off as scheduled
- If LTV was between 90% and 120% and DSCR was greater than or equal to 1.0x, then BlackRock assumed the loan maturity extended for 2 years
- If LTV was between 90% and 120% and DSCR was less than 1.0x, then BlackRock assumed the loan was defaulted
- If LTV was greater than 120%, then BlackRock assumed the loan was defaulted

Upon default, BlackRock assumed that the loan entered a 24-month workout period. During the workout period, all cash flows were applied to reduce the principal balance of the loan. BlackRock assumed collateral was liquidated at the end of the workout period and proceeds from the collateral liquidation were applied to pay down the outstanding balance of the loan. If there was any unpaid balance remaining after the application of such proceeds, it was recorded as a credit loss.

If a loan was extended per the conditions described above, behaviour during this period was determined utilising the same methodology employed during the originally contracted term of a loan i.e., using the same ICR or DSCR tests to determine payoff, extension, or default. The end of the 2-year extension period was treated as the new maturity date where the same behaviour at maturity test as described above was performed again.

It is important to note that only 2 maturity extensions were permitted for any loan. At the end of the second maturity period, the collateral was liquidated, and proceeds from the collateral were applied to pay down the balance of the loan. If there was any unpaid balance remaining after the application of such proceeds, it was recorded as a credit loss.

Liquidation Proceed Assumptions

To estimate liquidation proceeds, forward projected values for the vessel at the time of liquidation were used. A haircut of 10% in the Base Case and 15% in the Adverse Case was applied to the forward valuation to estimate net recoveries. This haircut level reflects BlackRock's estimates of reasonable transactional, liquidation or other accommodative costs in order to dispose the collateral based on discussions with multiple participants in the global shipping market.

6.5 Group B Banks

6.5.1 Portfolio Stratifications

Figure 112: Group B Shipping Loan Portfolio Stratifications[47]

		Aegean Baltic	Attica Bank	Credicom	Panellinia	Probank	Proton (Good Bank)	TT Hellenic Postbank	Total
Portfolio Limits	Funded (€MM)	201	0	0	0	37	107	21	366
	Unfunded Committed (€MM)	9	0	0	0	0	0	0	9
	Unfunded Uncommitted (€MM)	0	0	0	0	0	0	0	0
	Total Limit (€MM)	210	0	0	0	37	107	21	376
Performance Status	Current (%)	*91%*	*0*	*0*	*0*	*100%*	*19%*	*58%*	*69%*
	Defaulted (%)	*9%*	*0*	*0*	*0*	*0%*	*81%*	*42%*	*31%*
	90+ dpd (%)	*5%*	*0*	*0*	*0*	*0%*	*62%*	*27%*	*22%*
	Denounced (%)	*0%*	*0*	*0*	*0*	*0%*	*0%*	*0%*	*0%*
Loss Mitigation	Current Modified (0-89 dpd, %)	*2%*	*0*	*0*	*0*	*94%*	*17%*	*0%*	*15%*
	Modified Defaulted (%)	*1%*	*0*	*0*	*0*	*0%*	*70%*	*0%*	*21%*
Loan Term	WA Remaining Term (years)	1.8	0.0	0.0	0.0	1.1	3.6	0.0	1.8

6.5.2 Methodology Overview

Group B Shipping portfolios were modelled using the Corporate PD/LGD methodology described in Section 5.5.2, with the exception of Aegean Baltic Bank, which was modelled using the Shipping Model methodology described in Section 6.4. Aegean Baltic Bank's portfolio is wholly composed of shipping loans, and line-level losses were produced on this portfolio.

[47] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

Commercial Real Estate (CRE) Loans

7.1 Scope of Asset Quality Review

As of 30 June 2013, the funded balance of Commercial Real Estate (CRE) loans totalled EUR 2.9 BN across Group A Banks and EUR 382 MM across Group B Banks. The purpose of the Asset Quality Review was to provide an assessment of the assets held by each Bank and to gather qualitative information regarding the Banks' lending practices, portfolio monitoring, and workout procedures. BlackRock assessed CRE loan asset quality through the following processes:

- Conducted due diligence sessions to review and discuss Bank history, product types, origination strategy, portfolio performance, loss mitigation practices, and collateral valuation and recovery efforts
- Reviewed loan-level and collateral-level portfolio data for Group A and Group B Banks, as of 30 June 2013. For Group A Banks, BlackRock also conducted an analysis of 5-year historical performance, which was used to model probabilities of default
- BlackRock CRE specialists manually reviewed a sample of 23 Large Loans totalling EUR 1.3 BN in funded exposures held at the Group A Banks with the objective of assessing sustainable debt capacity for each borrower and estimating potential credit losses
- Conducted research and consulted external sources in order to inform model projections and calibrate models, where necessary. For example, BlackRock contracted an independent firm to provide historical Greek commercial real estate prices for various property types used to rebase CRE collateral

These qualitative and quantitative factors served as inputs to inform BlackRock's probability of default and loss given default models developed to generate CLP results.

The due diligence process for Group A Banks included an original RFI sent to each Bank prior to management due diligence sessions, loan-level data requests, and follow-up RFIs as necessary. The CRE RFI covered the following main areas:

- Lender profile and organisational history
- General product features and portfolio stratifications
- Origination and underwriting strategies
- Credit review and monitoring processes
- Payment collections
- Loss mitigation strategies
- Credit performance projections
- Collateral valuation and recovery practices, including collateral liquidation and valuation of non-tangible guarantees
- Loan ratings models
- Status of any merger integrations, including any effects on banking practices and data systems

BlackRock held two day-long due diligence sessions with the management teams at each Group A Bank to cover all Commercial asset classes, while one-day due diligence sessions were held to discuss both Retail and Commercial asset classes at the Group B Banks. In addition to the above listed RFI topics that were covered during management presentations, BlackRock also requested the following specific documentation to be submitted by each Group A and Group B Bank for all CRE loans:

- Loan-level data covering the scope of analysis
- Detailed description of the CRE loan portfolio by various stratifications (such as risk buckets)
- Product type descriptions

- Loan underwriting and credit approval documentation
- Schedule of historical payment status
- 5 years of historical ratings information (Group A Banks only)
- Bank organisational structure for CRE loan underwriting, loan servicing, and payment collection department
- Descriptions of modification options used for CRE loans
- Description of restructuring, workout, and loss mitigation strategies

If any information was unclear or incomplete from the due diligence sessions or data submissions, BlackRock submitted written follow-up RFIs, exchanged emails with relevant Bank employees, and held follow-up calls, where necessary.

7.2 Portfolio Stratifications and Risk Analysis

Data Collection and Review

In order to obtain an accurate and comprehensive understanding of the exposures held across the Banks, BlackRock built a standardised loan-level data template tailored to Greek commercial loans which covered over 200 data fields, including but not limited to:

- Borrower characteristics – Unique identifier[48], borrower type, region of risk, industry sector, etc.
- Loan characteristics – Unique identifier, facility type, funded balance, unfunded balance, total limit, term, etc.
- Current and historical performance – Internal rating, current status, arrears balance, current and historical modification status, specific provisions, etc.
- Collateral information – Unique identifier, collateral type, collateral value, date of last Bank valuation, lien information, etc.

Upon receipt of Bank submissions, BlackRock downloaded and on-boarded the datasets to a database system, which facilitated the organisation and standardisation of data across various output formats (i.e., .txt, .xls, etc.). This process allowed for the creation of portfolio stratifications, data gap reports, and the implementation of data overrides and assumptions. The original data submissions by the Banks varied in the level of completeness, and over the course of several weeks, BlackRock and the Banks engaged in a comprehensive data reconciliation process.

BlackRock produced detailed stratification tables in a standard format and compared these tables to summary tables provided by each of the Banks to confirm balances and other key risk factors. This process allowed the Banks to acknowledge that the data supplied to BlackRock was consistent with the Banks' own understanding of their respective portfolios. Inconsistencies were addressed via iterative data re-submissions, email correspondence, teleconferences, as well as in-person meetings. Reconciliations of differences were performed subject to materiality and to the extent practical, within the limited timeframe during which the analysis was conducted.

Portfolio Overview and Summary Statistics

The Group A Bank CRE universe encompassed EUR 2.9 BN of funded balances as of 30 June 2013. Piraeus had the largest CRE exposure of the 4 Group A Banks, with EUR 1.7 BN in total funded balances (61% of the total Group A Bank CRE exposure). Alpha had the smallest CRE portfolio, with a EUR 227 MM funded balance, representing 8% of the Group A CRE Universe.

[48] For Banks that had recently acquired institutions (Alpha, NBG and Piraeus), BlackRock requested a unique identifier for exposures in the Parent Bank and the acquired entities

Figure 113: Overview of Group A Banks CRE Portfolio[49]

		Alpha	Eurobank	NBG	Piraeus	Total
Portfolio Limits	Funded (€MM)	227	669	235	1,744	2,876
	Unfunded Committed (€MM)	0	5	0	0	5
	Unfunded Uncommitted (€MM)	30	42	0	1	73
	Total Limit (€MM)	257	716	235	1,745	2,953
Performance Status	Current (%)	*95%*	*61%*	*97%*	*61%*	*67%*
	Defaulted (%)	*5%*	*39%*	*3%*	*39%*	*33%*
	90+ dpd (%)	*5%*	*33%*	*3%*	*32%*	*27%*
	Denounced (%)	*0%*	*7%*	*0%*	*9%*	*7%*
Loss Mitigation	Current Modified (0-89, %)	*0%*	*9%*	*19%*	*24%*	*18%*
	Modified Defaulted (%)	*0%*	*8%*	*0%*	*9%*	*7%*
Security	Secured by Tangible Collateral (%)	*100%*	*92%*	*100%*	*100%*	*98%*
Loan Term	WA Remaining Term (years)	5.5	4.2	11.4	8.0	7.2

- The aggregate percentage of defaulted balances across all Group A Banks was approximately 33%, while loss mitigation was performed on 25% of the total universe.
- Eurobank had the highest percentage of 90+ loans at 33%, followed closely by Piraeus, while NBG had the lowest percentage of 90+ loans at 3%
- Piraeus had the highest percentage of current modified loans at 24%
- The weighted average percentage of funded exposure secured by tangible collateral amounts to 98% across all Group A Banks
- Piraeus had the largest percentage of loss mitigation performed to date. However, it is important to note that loss mitigation definitions and tracking policies are not entirely consistent across Banks. For example, it is important to note the following about Alpha's modification statistics:
    - Alpha does not maintain rescheduling information in its systems, which results in a systematic understatement of modified exposure at the Bank
    - While restructuring information is maintained for non-defaulted exposures (via a "Restructured" rating category), the flag is removed as soon as the exposure enters default. As a result, Modified Defaulted exposure is reported at 0%

7.3 Large Loan Underwriting

Overview

As described in Section 5.3, BlackRock conducted a fundamental credit underwriting on a selected sample of borrowers from the Commercial Large Loan universe. This sample included 23 CRE exposures totalling approximately EUR 1.3 BN in funded exposure, representing 53% of the CRE Large Loan universe. Results for CRE Large Loans include one borrower which was mapped to an identical exposure at Piraeus Bank, which was not originally in the Large Loan underwriting sample, thereby increasing the coverage to 57% of the CRE Large Loan universe. A summary of CRE underwritten loans is provided below.

[49] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

Figure 114: CRE Large Loan Underwriting Sample

Bank	# Borrowers	Sample Funded Exposure (€ MM)	Total Funded Exposure (€ MM)	Percent Covered
Alpha	7	432	526	82%
Eurobank	7	264	346	76%
NBG	3	243	272	89%
Piraeus	7	406	1,235	33%
Total	***24***	***1,345***	***2,379***	***57%***

The BlackRock CRE underwriting team consisted of 4 staff members (2 of whom were RICS qualified), each with 5-10 years of experience in CRE financing and/or the workout and restructuring of distressed CRE portfolios with specific experience in Greece. The Banks made physical files available for each borrower in a data room located on their respective premises during the Large Loan underwriting workstream. One underwriter was assigned to each individual credit and was responsible for the underwriting process in its entirety. The files typically included the original credit memorandum and underwriting analysis as well as original and updated appraisals, borrower financials, and information regarding any guarantees, cross-collateralisation or other structural loan features. If any clarification or further information was required specific to a loan, the underwriters sent questions to the respective Bank RM and a follow-up discussion was held either electronically, via telephone, or in-person meetings.

In addition to reviewing the underwriting and management practices of the Bank through loan file reviews, collateral valuation was a critical component of the underwriting analysis. BlackRock engaged NAI to conduct site visits for collateral properties located within Attica. Collateral that was located outside of Attica was valued using a desktop approach. These third-party valuations served as an additional data point for estimating the current valuation and future performance of the Large Loan sample properties.

Underwriters also reviewed publicly available information for each borrower, as well as various industry and external market research resources to create a summary of CRE market trends and forecasts, and develop asset value projections by property type and region for the fundamental analysis of the Commercial LGD analytics.

Each underwriting result was reviewed by the leadership committee of the CRE team and the entire underwriting team. Certain credits were further reviewed by the broader team to ensure quality control.

CRE Large Loan Underwriting Approach

Property-level actual in-place revenue, operating expense, net operating income ("NOI"), and net cash flow ("NCF") figures were extracted from the most recent property operating statements and rent rolls in the loan files. If only revenues were available in the loan files, BlackRock made assumptions for market and property type specific operating expenses to derive NOIs and NCFs. Starting NOI and NCF figures were used to estimate current property valuation using the Direct Cap valuation approach, which is a methodology that values income-producing property by dividing the property's net cash flow by an estimated required unlevered yield. Underwriters used historical and current information to build an income statement for the property that served as the basis for fundamental performance analysis. Underwriters made assumptions for non-stabilised properties such as those under construction or vacant, to make assumptions about the speed at which the properties could be expected to stabilise. Property performance was projected using forward property fundamental curves provided by NAI. These fundamental curves relied heavily on the macroeconomic forecasts provided by the Bank of Greece, most notably forward projections for unemployment, GDP, disposable income and inflation. The CRE fundamental curves included rental rate curves, occupancy curves, and forward yield curves. Forward NCF values were projected using expected forward rental and occupancy rates, and were then

compared against projected debt service payments to derive future debt service coverage ratios ("DSCR"). These ratios were used to determine loan performance and potential payment defaults.

BlackRock applied forward yield curves to determine future property values and calculate LTV ratios. ICR, DSCR, and LTV triggers were used to determine future loan behaviour. Formulas for these ratios are below:

- $ICR\ for\ a\ given\ quarter = \frac{(Required\ interest\ payment\ for\ such\ quarter)}{Collateral\ cash\ flow\ for\ that\ quarter}$
- $DSCR\ for\ a\ given\ quarter = \frac{(Required\ principal+interest\ \ payment\ for\ such\ quarter)}{Collateral\ cash\ flow\ for\ that\ quarter}$
- $LTV\ at\ any\ point\ of\ time = \frac{(Projected\ principal\ balance\ at\ such\ time)}{BlackRock\ forecasted\ collateral\ value\ at\ such\ time}$
- $Property\ Value\ at\ any\ point\ of\ time\ = \frac{(Property\ level\ NCF)}{Projected\ Unlevered\ Yield\ Requirement}$
  $(\text{i.e., direct cap valuation approach})$

Loan behaviour during the term of a loan (i.e., prior to maturity date) was determined based on DSCR tests, whereby it was assumed that a slightly deficient loan from a DSCR perspective would not be put into workout.

- If the DSCR was projected to be > 0.9x, the loan was assumed to perform
- If the DSCR was projected to be < 0.9x, the loan was assumed to default and enter a workout period, during which the property would ultimately be liquidated.

Timing assumptions for liquidation were dependent on whether the property was owned by an SPV structure or was leased to the borrower in a sale-leaseback structure.

After the loan's maturity date, future behaviour was determined using combined LTV and ICR tests:

- If LTV < 90%, then BlackRock assumed the loan is refinanced or pays off or as scheduled
- If LTV is between 90% and 120% and ICR >= 1.0x, BlackRock assumed the loan is rescheduled and the maturity is extended for 2 years
- If LTV > 120% or ICR < 1.0x, BlackRock assumed the loan defaults and enters into workout

If a loan was projected to be rescheduled based on the above LTV and ICR triggers, it would be tested again using these same triggers at the new maturity date (2 years later). A loan projected to enter into workout would be liquidated after a 24 or 36 month period at the expected forward collateral value, net of liquidation expenses and preferential claims. The liquidation timeframe and associated expense assumptions often differed slightly across property type, sponsor, Bank, and financing structure to appropriately address key findings from the loan file reviews and discussions with credit officers.

All assumptions provided by underwriters and estimated loss projections were reviewed in multiple rounds of peer reviews to ensure the quality of the results.

Large Loan Sample Portfolio – Credit Loss Projections

Individual credit loss projections were calculated at the loan and borrower level in the Base and Adverse Cases for the Large Loan CRE sample. Both the timing and absolute value of losses were incorporated directly into the CLP results. BlackRock underwriters predicted behaviour using the deterministic approach described above. Losses in the event of default incorporated forward CRE macroeconomic forecasts provided by the Bank of Greece.

7.4 Modelling Methodology

For the loans which were not part of the Large Loan sample (the "Out of Sample" Portfolio), BlackRock employed the same ratings-based PD/LGD approach described in Section 5.4.

The EAD for CRE loans that were not a part of the Large Loan underwriting sample was calculated following the same methodology described for Corporate exposures as further described in Section 5.4.

EAD was adjusted by either contractual or agreed upon amortisation schedules, if deemed reliable. Cash flow sweeps, when in place, were assumed to be effective until projected default. In a number of cases, amortisation schedules agreed upon during a restructuring or rescheduling were determined to be overly optimistic or the borrower was projected to default prior to honouring the agreed upon amortisation in full.

7.5 Group B Banks

7.5.1 Portfolio Stratifications

Figure 115: Group B CRE Loan Portfolio Stratifications[50]

		Aegean Baltic	Attica Bank	Credicom	Panellinia	Probank	Proton (Good Bank)	TT Hellenic Postbank	Total
Portfolio Limits	Funded (€MM)	0	0	0	37	0	319	25	382
	Unfunded Committed (€MM)	0	0	0	0	0	0	0	0
	Unfunded Uncommitted (€MM)	0	0	0	0	0	0	0	0
	Total Limit (€MM)	0	0	0	37	0	319	25	382
Performance Status	Current (%)	*0%*	*0%*	*0%*	*71%*	*0%*	*22%*	*92%*	*31%*
	Defaulted (%)	*0%*	*0%*	*0%*	*29%*	*0%*	*78%*	*8%*	*69%*
	90+ dpd (%)	*0%*	*0%*	*0%*	*29%*	*0%*	*21%*	*7%*	*21%*
	Denounced (%)	*0%*	*0%*	*0%*	*11%*	*0%*	*0%*	*1%*	*1%*
Loss Mitigation	Current Modified (0-89, %)	*0%*	*0%*	*0%*	*17%*	*0%*	*16%*	*11%*	*15%*
	Modified Defaulted (%)	*0%*	*0%*	*0%*	*6%*	*0%*	*7%*	*0%*	*7%*
Security	Secured by Tangible Collateral (%)	0%	0%	0%	87%	0%	95%	0%	88%
Loan Term	WA Remaining Term (years)	0.0	0.0	0.0	4.7	0.0	1.2	14.9	2.4

7.5.2 Methodology Overview

The Group B CRE portfolio was modelled using the Group B PD/LGD methodology used for Corporates, which is described in detail in Section 5.5.2

[50] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

Small and Medium Enterprise (SME) Loans

8.1 Scope of Asset Quality Review

As of 30 June 2013, the funded balance Small and Medium Enterprise (SME) loans totalled EUR 37.5 BN across Group A Banks and EUR 3.2 BN across Group B Banks. The purpose of the Asset Quality Review was to provide an assessment of the assets held by each Bank and to gather qualitative information regarding the Banks' lending practices, portfolio monitoring and workout procedures. BlackRock assessed SME loan asset quality through the following processes:

- Conducted management due diligence sessions to review and discuss Bank history, product types, origination strategy, loss mitigation practices, and collateral valuation and recovery efforts
- Reviewed loan-level and collateral-level SME portfolio data for Group A and Group B Banks as of 30 June 2013. For Group A Banks, BlackRock also conducted an analysis of 5 years of historical ratings migration, which was used to inform default transition matrices and model probability of default.
- Engaged EY to review a sample of SME loans held at Group A Banks. The scope encompassed review of credit ratings, application of Bank policies, security and collateral adequacy, and an assessment of sustainable cash flow. EY also determined the performance status of each loan and compared it to the status assigned to the loan by the Bank. A total of 285 files were reviewed, consisting of 200 files selected from Group A Parent Bank exposures and 85 loan files from entities that were recently acquired by the Group A Banks[51]. The AQR loan file reviews samples included the 135 SME loan file reviews performed as a part of the TAR exercise

Qualitative and quantitative findings derived from the loan file review process informed BlackRock's probability of default and loss given default models developed to generate CLP results.

The due diligence process for Group A Banks included an RFI sent to each Bank prior to management due diligence sessions, loan-level data requests, and follow-up RFIs as necessary. The SME RFI covered the following main areas:

- Lender profile and organisational history
- General product features and portfolio stratifications
- Origination and underwriting strategies
- Credit review and monitoring processes
- Loan payment collection and servicing operations
- Loss mitigation strategies
- Historical defaults
- Credit performance projections
- Collateral valuation and recovery practices, including collateral liquidation and valuation of non-tangible guarantees
- Loan ratings models
- Status of any merger integrations, including any effects on banking practices and data systems

BlackRock held two day-long due diligence sessions with management at each Group A Bank to cover all Commercial asset classes, while one-day due diligence sessions were held to discuss both Retail and Commercial asset classes at Group B Banks. In addition to the above RFI topics that were covered during management presentations, BlackRock also requested the following specific documentation to be submitted by

[51] Includes Emporiki, which was acquired by Alpha; Proton and TT, which were acquired by Eurobank; ATE, Geniki, Bank of Cyprus, Cyprus Popular Bank, Hellenic Bank and Millennium, which were acquired by Piraeus; and Probank, which was acquired by NBG.

each Group A and Group B Bank:

- Detailed loan-level data submission
- Product type descriptions
- Detailed summaries of the SME loan portfolio by various risk metrics
- Loan underwriting and credit approval documentation
- Schedule of historical payment status
- Bank organisational structure for SME loan underwriting, loan servicing, and payment collection department
- Descriptions of modification options used for SME loans
- Description of restructuring, workout, and loss mitigation strategies

If any information was unclear or incomplete from the due diligence sessions or data submissions, BlackRock submitted written follow-up RFIs, exchanged emails with relevant Bank employees, and held follow-up calls, where necessary.

8.2 Portfolio Stratifications and Risk Analysis

For Data Collection and Review, please see corresponding Section 5.2 Corporate Portfolio Stratifications and Risk Analysis.

Portfolio Summary Statistics

The charts below show some of the key stratifications observed across the Group A Banks. The total funded balances of the SME portfolios across all Group A Banks amounted to EUR 37.5 BN as of 30 June 2013.

Figure 116: Overview of Group A Banks SME Portfolios[52]

		Alpha	Eurobank	NBG	Piraeus	Total
Portfolio Limits	Funded (€MM)	9,967	5,494	4,689	17,378	37,527
	Unfunded Committed (€MM)	24	300	370	811	1,505
	Unfunded Uncommitted (€MM)	715	988	24	1,389	3,117
	Total Limit (€MM)	10,706	6,782	5,083	19,578	42,148
Performance Status	Current (%)	*61%*	*63%*	*63%*	*47%*	*55%*
	Defaulted (%)	*39%*	*37%*	*37%*	*53%*	*45%*
	90+ dpd (%)	*38%*	*34%*	*32%*	*46%*	*40%*
	Denounced (%)	*28%*	*20%*	*17%*	*21%*	*22%*
Loss Mitigation	Current Modified (0-89 dpd, %)	*4%*	*6%*	*9%*	*7%*	*6%*
	Modified Defaulted (%)	*0%*	*3%*	*4%*	*10%*	*6%*
Security	Secured by Tangible Collateral (%)	*88%*	*78%*	*84%*	*83%*	*84%*
Loan Term	WA Remaining Term (years)	3.2	2.5	2.7	2.8	2.9

- As of 30 June 2013, the aggregate percentage of defaulted balances across all Group A Banks was approximately 45%, while loss mitigation had been performed on 12% of the total SME universe
- Piraeus had the highest percentage of 90+ loans at 46% while NBG had the lowest percentage of 90+ loans at 32%
- NBG had the highest percentage of current modified loans at 9%

[52] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

- The weighted average percentage of funded exposure secured by tangible collateral amounts to 84% across all Group A Banks At 88%, Alpha had the highest % of funded balance secured by tangible collateral while Eurobank had the lowest coverage percentage at 78%
- NBG had the largest percentage of loss mitigation performed to date. However, it is important to note that loss mitigation definitions and tracking policies are not entirely consistent across Banks. For example, it is important to note the following about Alpha's modification statistics:
    - Alpha does not maintain rescheduling information in its systems, which results in a systematic understatement of modified exposure at the Bank
    - While restructuring information is maintained for non-defaulted exposures (via a "Restructured" rating category), the flag is removed as soon as the exposure enters default. As a result, Modified Defaulted exposure is reported at 0%

8.3 Loan File Review

SME loan file reviews were based on small samples when compared to the total portfolio size. Therefore, any quantitative or qualitative results derived by BlackRock should not be extrapolated to apply to the entire portfolio from which the sample was taken or to the respective Bank. Results should be interpreted as directional and indicative in nature only. They should also only be assessed in conjunction with findings from other qualitative and quantitative processes performed during the AQR review.

BlackRock engaged EY to review and assess a sample of 285 SME borrower loan files selected by BlackRock to further inform on potential risk factors that could impact credit loss projections. The sample covered all Group A Bank portfolios across industry sectors and credit quality, including recently acquired entities for Alpha and Piraeus.

The LFR process highlighted several key points with respect to the Greek SME lending market. While these observations were not based on representative statistics, they provided directional insights into Greek SME portfolios and current Bank practices to (i) sense check the data received from the Banks; (ii) inform qualitative modelling assumptions and adjustments; and (iii) to cross-check and contextualise quantitative modelling output.

Scope

The purpose of the loan file reviews was to complement the findings from above-mentioned due diligence process (e.g. due diligence sessions, site visits and documentation review), in particular:

- Determine appropriateness of Banks' internal loan status assessment
- Review security and lien position of collaterals
- Develop a view on Bank origination, credit sanctioning and portfolio management practices (e.g., rescheduling or other modification activity)

To achieve this, EY reviewed the credit file source documentation including the loan application, the company financials, the guarantor and shareholder information, collateral valuation reports, as well as the Bank's internal calculations and notes. The Banks made credit officers available to discuss key questions and initial observations. Based on the information, EY completed a review template for each loan, developed in conjunction with BlackRock, as further described below. EY's assessment of the borrower's performance status was compared to the performance status provided by the Bank.

Sampling Process

The sample was selected according to risk-based criteria targeting specific balance, risk, and status metrics described below.

Figure 117: SME LFR Selection Criteria Targets

Criteria	Target
Balance Size	• 50 % with funded balances between EUR 1 – EUR 3 MM • 45% with funded balances between EUR 3 – EUR 10 MM • 5% with funded balances over EUR 10 MM
Geography	• 100% in Attika / Athens area, inclusive of suburbs, in order to ensure underwriters had access to the loan files
Risk Distribution	• 30% that were considered Low/Medium Risk • 30% that were considered High Risk • 25% that were Defaulted (Non-Legal) • 15% that were in Legal Status
Modification Status	• 35% Modified • 65% Non-Modified
Industries	• Representative across industries, informed by SME data tapes

The sample of 285 SME loans files was comprised of 50 loan files per Group A Bank as well as a total of 85 loan files across recently merged entities. The total reviewed sample consisted of 285 borrower relationships encompassing 883 loan facilities with an aggregate exposure of EUR 1,224 MM. It comprised 50 SME borrowers from each Group A Parent Bank, 25 SME borrowers from Emporiki, 20 SME borrowers from each of Cyprus Popular Bank and Bank of Cyprus, and 10 SME borrowers from each of ATE and Probank. The size of the samples selected from recently acquired entities was a function of respective portfolio size relative to the Group A Parent Banks.

Figure 118: SME LFR Sample

Bank	# Borrowers	# Facilities	Exposure (EUR MM)	Count Default / Impaired (Bank Classification)
Parent Entities				
Alpha	50	147	195	46%
Eurobank	50	130	280	40%
NBG	50	170	188	32%
Piraeus	50	168	175	42%
Recently Merged Entities				
ATE Bank (Piraeus)	10	20	24	40%
Bank of Cyprus (Piraeus)	20	76	94	60%
Cyprus Popular Bank (Piraeus)	20	57	106	45%
Emporiki (Alpha)	25	81	102	48%
Probank (NBG)	10	34	60	10%
Total	***285***	***883***	***1,224***	***41%***

Loan File Review Template

The SME and SBP LFRs were based on a review template, which was developed and agreed between BlackRock and EY and covered the following areas: (i) summary of financial statements including P&L, balance sheet, sustainable business position, leverage statistics; (ii) summary of facilities information; (iii) summary of real estate and other collateral securing the Bank exposures; (iv) credit performance and (v) an overall engagement and key risk summary report.

The template allowed EY to assess each borrower's repayment capacity through an analysis of the sustainable cash flow and the adequacy of the collateral. The template is provided in the Figures below.

Figure 119: SME / SBP Sample Loan File Review Template (1/2)

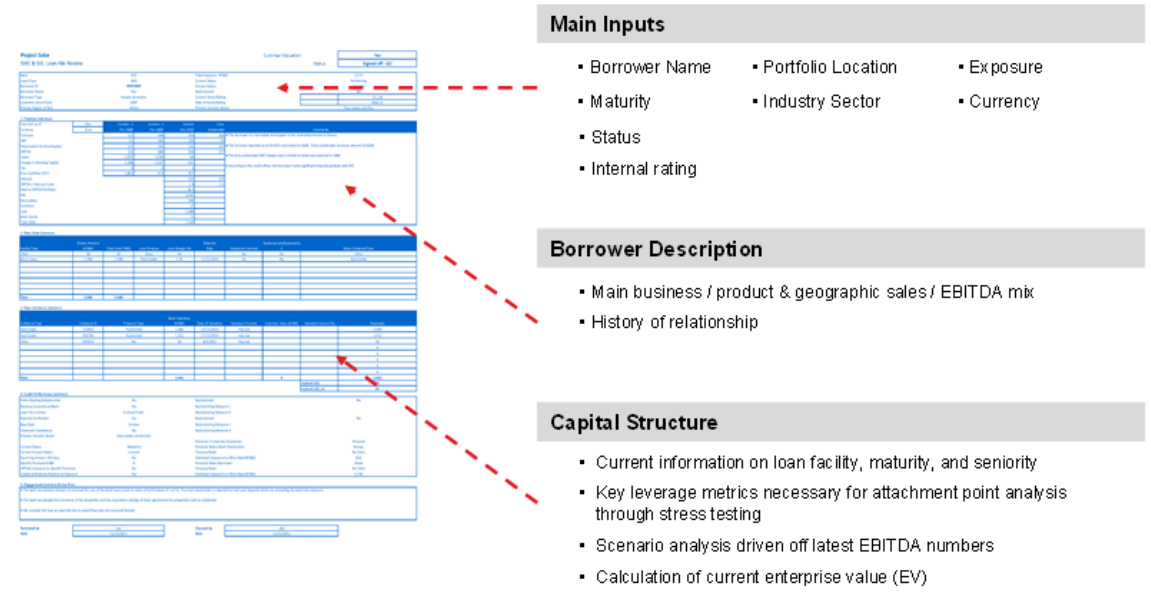
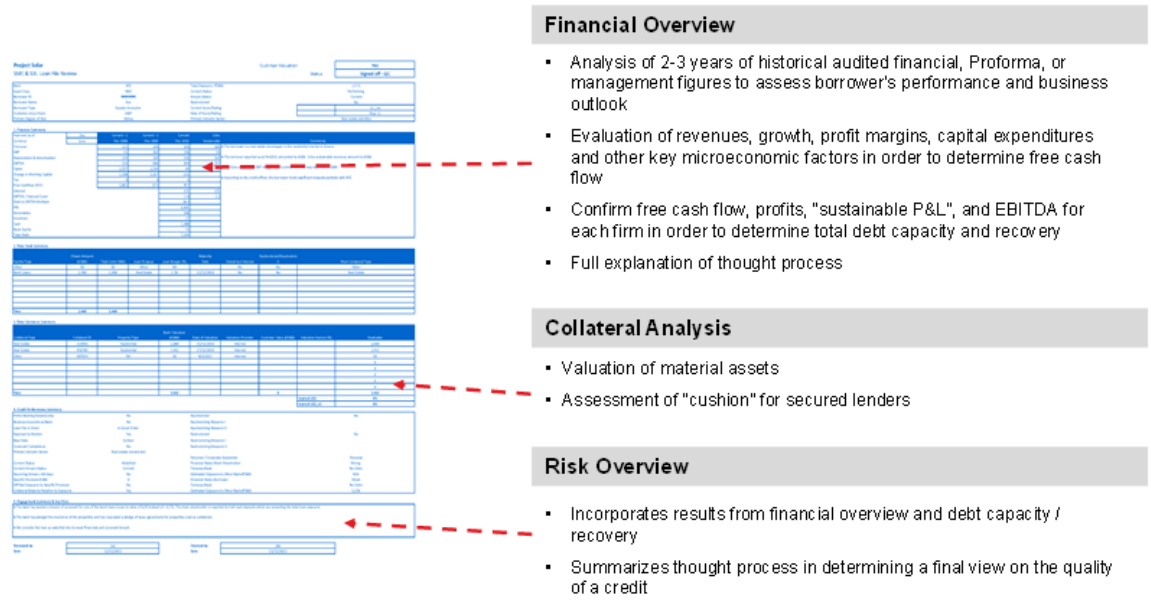


Figure 120: SME / SBP Sample Loan File Review Template (2/2)



Key Findings

Several key financial trends in the Greek SME market were highlighted through LFR findings. Turnover declined by 15% on average between 2010 and 2011 and by 14% on average between 2011 and 2012. Total Bank limits in the SME sample declined by 4% on average between 2010 and 2011 and by 8% on average between 2011 and 2012, highlighting the ongoing deleveraging in the sector as well as the reduced needs for working capital due to the decline in turnover.

Across the entire sample, BlackRock/EY classified 42% of the Bank-classified Performing loans as Watchlist, and 6% as Defaulted or Impaired. Additionally, BlackRock/EY classified 28% of the Bank-classified Watchlist loans as Defaulted or Impaired. This comparison is shown in the Figure below.

Figure 121: BlackRock / EY Current Status Assessment vs. Banks Current Status

Bank Current Status	BlackRock / EY Current Status				
	Performing (%)	Watchlist (%)	Defaulted or Impaired (%)	Files (#)	Files (%)
Performing	52	42	6	84	29
Watchlist	0	72	28	83	29
Default or Impaired	0	0	100	118	41
Total Sample	***15***	***33***	***51***	***285***	***100***

Loan Modification Status Summary

The table below depicts BlackRock/EY assessment of modifications compared to the Banks' own assessments and shows a different assessment for 45 loans out of the total sample of 285 loans (16%). This could be due to modifications that occurred after the Reference Date or the different definitions of modifications between the Banks and BlackRock/EY.

Figure 122: BlackRock / EY Level of Modifications vs. Bank Reported Level of Modification

Loan Modification Status Summary	Banks		BlackRock / EY		Difference (BlackRock / EY - Banks)	
Metric	# of Files	% of Files	# of Files	% of Files	# of Files	% of Files
Modified	90	32%	127	45%	37	13%
Non-Modified	195	68%	158	55%	-37	-13%
Mod in tape and non-mod in file	-	-	4	1%	-	-
Non-mod in tape and mod in file	-	-	41	14%	-	-
Total	***285***	***100%***	***285***	***100%***		

Loan File Quality

BlackRock found that the majority of loan files in the sample were complete with the necessary information available to make a credit decision, with 244 files (86%) classified as In Good Order or Adequate, as defined below.

Figure 123: Loan File Quality Summary

Loan File Quality Summary		
Metric	# of Files	# of Files
Loan files assessed "in good	104	36%
Loan files assessed "adequate"	140	49%
Loan files assessed "incomplete"	41	14%
Total	***285***	***100%***

Note (1): **In Good Order:** Important documentation (loan agreement and term sheet with key terms signed by the client, client identification documents, credit approval documents, recent financial information, Teiresias Credit Checks, collateral documentation, documents related to rescheduling/restructuring, etc.) is included and up to date;
Note (2): **Adequate:** Important documentation is included but omissions exist (information is out-dated, credit checks are not evidenced, tax return of the key shareholder is missing, etc.);
Note (3): **Incomplete:** Significant omissions exist. (loan agreement, term sheet, collateral, etc.)

Credit Performance Summary

Across the entire sample, BlackRock/EY classified 42% of the files as Current, 17% as 1-90 DPD, 24% over 90 DPD and 17% in Legal Status. The largest differences between the Bank classification and the BlackRock/EY classification was in the over 90 DPD and Modified category, with the Banks classifying 5% as over 90+ DPD and Modified versus BlackRock/EY classifying at 10%. This comparison is shown in more detail in the Figure below.

Figure 124: Credit Performance Summary

Credit Performance Summary	Banks		BlackRock / EY		Difference (BlackRock / EY - Banks)	
Metric	# of Files	%of Files	# of Files	%of Files	# of Files	%of Files
Current	124	44%	120	42%	-4	-1%
1-90 dpd modified	21	7%	28	10%	7	2%
1-90 dpd non-modified	31	11%	20	7%	-11	-4%
90+ dpd modified	15	5%	28	10%	13	5%
90+ dpd non-modified	47	16%	41	14%	-6	-2%
Legal Status	47	16%	48	17%	1	0%
Total	***285***	***100%***	***285***	***100%***		

Portfolio Management Summary

Banks have, in general, been engaged in significant restructuring and rescheduling activity (47% of loan file sample), mostly in the form of a grace periods, rescheduled repayment terms, or facility restructurings (e.g., conversion of a working capital facility into a term loan with extended maturity). Furthermore, 24% of loans have undergone more than 1 restructuring (as found by BlackRock/EY). The Banks have sought additional collateral for 59% of loans, demonstrating a strong focus on this practice.

Figure 125: Portfolio Management Summary

Portfolio Management Summary	BlackRock / EY	
Metric	# of Files	%of Files
Loans with 0 Reschedulings/Restructurings	151	53%
Loans with 1 Reschedulings/Restructurings	66	23%
Loans with 1+ Reschedulings/Restructurings	68	24%
Total	***285***	***100%***

Borrower Financial Situation Summary

Overall, SME borrowers in the sample faced a stressed economic situation experiencing a decline in turnover. 78% of borrowers with available financials had a turnover decline between 2011 and 2012 and elevated levels of accounts receivables. More than 40% of borrowers had a ratio of receivables to turnover of above 50%. Furthermore, the file reviews revealed that borrowers had, in most cases, fully drawn their committed facilities, partially as a result of the Banks aggressively cutting limits over the past 3 years. Over half of the facilities were used to finance working capital. While all sectors were affected by the stressed economic situation, the construction sector seemed more heavily impacted.

The LFR revealed that a significant percentage of SMEs relied on shareholder support to fund working capital and, potentially, also to meet debt service obligations. The 42% of loans rated Performing by Banks have a median debt to EBITDA multiple ratio of 6.2x which can be characterised as elevated. Out of a sample of 167 loans rated Performing or Watchlist by the Banks, 63 loans (38%) of loans have a EBITDA / interest cover ratios of less than 1. Leverage ratios in the Watchlist and Defaulted categories can be characterised as

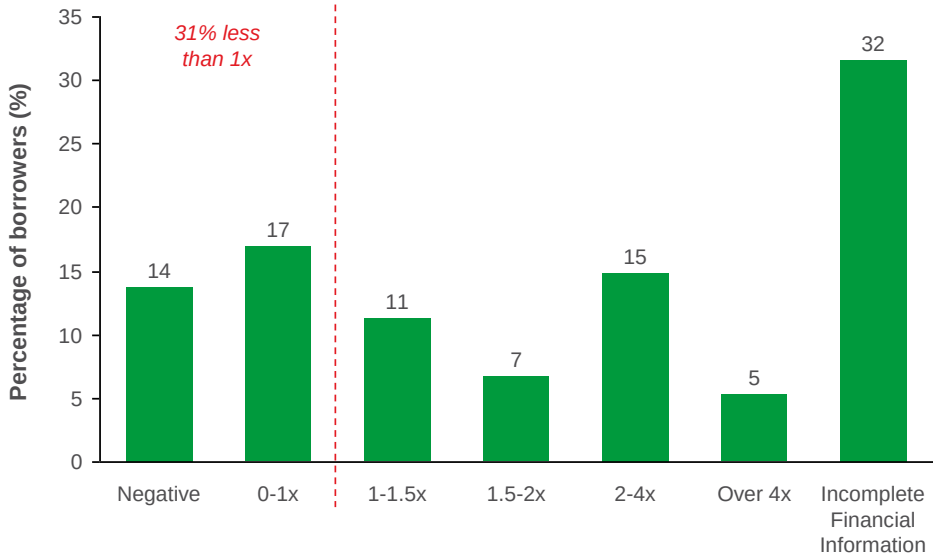
unsustainable with median ratios of 13.2 and 13.5 respectively. These metrics highlight the highly levered profile of Greek SME borrowers in today's economic landscape.

Figure 126: Borrower Financial Situation Summary

Borrower Financial Situation Summary	Banks		BlackRock / EY		Difference (BlackRock / EY - Banks)	
Metric	**# of Files**	**% of Files**	**# of Files**	**% of Files**	**# of Files**	**% of Files**
Decrease of turnover in 2012	159	78%	-	-	-	-
Total	***205***	***100%***				
Account Receivable / Turnover Ratio over 50%						
Performing	38	32%	21	18%	-17	-14%
Watchlist	49	42%	56	47%	7	6%
Default / Impaired	31	26%	41	35%	10	8%
Total	***118***	***100%***	***118***	***100%***		
Loans performing according to Banks & rated watchlist by BlackRock/EY	-	-	35	42%	-	-
Total	***84***	***100%***	***84***	***100%***		
2012 EBITDA / interest cover less than 1						
Performing	18	19%	2	2%	-16	-17%
Watchlist	45	48%	43	46%	-2	-2%
Default / Impaired	31	33%	49	52%	18	19%
Total	***94***	***100%***	***94***	***100%***		
Median Debt to EBITDA Ratio [1]						
Performing	6.2	-	5.4	-	-0.8	-
Watchlist	13.2	-	10.2	-	-3.0	-
Default / Impaired	13.5	-	19.8	-	6.3	-

The LFR revealed that almost a third of sampled borrowers had interest payments that exceeded their 2012 EBITDA. An additional third of the sample had incomplete financial information, potentially indicating that the borrowers are likely to default and have stopped providing financial data to the Bank.

Figure 127: 2012 EBITDA Interest Coverage Ratio Summary



Collateral Summary

The LFR confirmed that the majority of SME loans were collateralised, with 62% of facilities secured by real estate/land and with a total of 81% of facilities secured by some type of tangible collateral. In addition, for 239 loans (84%), shareholders provided a personal or corporate guarantee. Banks have stated during due diligence meetings that the threat of enforcement of personal guarantees is used in borrower negotiations to achieve forced or voluntary pre-notations of additional real estate collateral. However, in many cases, the pre-notated property is a 2nd or 3rd lien. Despite some evidence from the Banks that additional collateral has been identified and/or provided by borrowers in certain instances, it is challenging to determine the value of such personal guarantees at the portfolio level. In addition, BlackRock and EY found only 44% of the facilities held collateral

that was material relative to the borrower exposure.

Figure 128: Collateral Summary

Collateral Summary	Banks		BlackRock / EY		Difference (BlackRock / EY - Banks)	
Metric	# of Files	% of Files	# of Files	% of Files	# of Files	% of Files
Secured facilities	230	81%	-	-	-	-
Facilities with real estate & land collateral	177	62%	-	-	-	-
Borrowers providing personal guarantees	239	84%	-	-	-	-
Material collateral relative to exposure	-	-	124	44%	-	-
Total	***285***	***100%***	***285***	***100%***		

Note (1): **Material collateral relative to exposure** refers to when the value of the collateral (in terms of market value) over total exposure is 80% or more of the total exposure

Borrower Industry Concentration

Borrowers sampled as part of the LFR were concentrated in the Commerce industry, which made up 40% of the borrower industry distribution. Construction and Manufacturing, two sectors that have been particularly affected by the Greek macroeconomic environment, also accounted for over 35% of the industry distribution.

Figure 129: Borrower Industry Concentration

Borrower Industry Concentration		
Metric	# of Files	% of Files
Commerce	113	40%
Constructions	45	16%
Manufacturing	55	19%
Services	30	11%
Tourism	17	6%
Other	25	9%
Total	***285***	***100%***

8.4 Modelling Methodology

The BlackRock SME modelling methodology follows the same ratings based expected loss approach used for Corporate exposures, which incorporates exposure at default ("EAD"), probability of default ("PD") and loss-given-default ("LGD") as the main parameters in estimating losses over time, with credit loss projections ("CLP") calculated as follows:

$$CLP = EAD * PD * LGD$$

The EAD and PD for SME loans were calculated following the same methodology described for Corporate exposures as further described in Section 5.4. The historical data used for the SME PD model estimation related to SME borrowers only.

BlackRock applied the same methodology to determine borrower level LGDs for SME loans as for Corporate loans (described in Section 5.4), with the exception of adjusted recovery floor assumptions for secured and unsecured loans. Secured SME loans received a 25% recovery floor in the Base Case and a 15% recovery floor in the Adverse Case. Unsecured SME received a 20% recovery floor in the Base Case and a 10% recovery floor in the Adverse Case.

8.5 Group B Banks

8.5.1 Portfolio Stratifications

Figure 130: Group B SME Loan Portfolio Stratifications[53]

		Aegean Baltic	Attica Bank	Credicom	Panellinia	Probank	Proton (Good Bank)	TT Hellenic Postbank	Total
Portfolio Limits	Funded (€MM)	2	1,122	20	280	1,552	154	65	3,195
	Unfunded Committed (€MM)	0	111	3	0	12	30	0	157
	Unfunded Uncommitted (€MM)	0	0	0	1	406	0	9	416
	Total Limit (€MM)	2	1,232	24	281	1,971	184	74	3,768
Performance Status	Current (%)	*100%*	*43%*	*50%*	*38%*	*84%*	*49%*	*87%*	*64%*
	Defaulted (%)	*0%*	*57%*	*50%*	*62%*	*16%*	*51%*	*13%*	*36%*
	90+ dpd (%)	*0%*	*54%*	*50%*	*48%*	*7%*	*16%*	*9%*	*28%*
	Denounced (%)	*0%*	*39%*	*25%*	*34%*	*0%*	*0%*	*1%*	*17%*
Loss Mitigation	Current Modified (0-89 dpd, %)	*0%*	*0%*	*5%*	*21%*	*20%*	*6%*	*0%*	*12%*
	Modified Defaulted (%)	*0%*	*0%*	*2%*	*32%*	*5%*	*6%*	*2%*	*6%*
Security	Secured by Tangible Collateral (%)	*0%*	*57%*	*77%*	*45%*	*93%*	*42%*	*67%*	*73%*
Loan Term	WA Remaining Term (years)	0.7	1.7	0.9	3.8	4.6	1.1	3.7	3.3

8.5.2 Methodology Overview

The Group B SME portfolio was modelled using the Group B PD/LGD methodology used for Corporates, which is described in detail in Section 5.5.2. The historical data used for the SME PD model estimation related to SME borrowers only.

[53] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

Leasing and Factoring

9.1 Portfolio Stratifications and Risk Analysis

The Data Collection and Review process for Leasing and Factoring was similar to the process described in Section 5.2.

Portfolio Overview and Summary Statistics

As of 30 June 2013, the Group A Bank Leasing and Factoring universe encompassed EUR 5.1 BN and EUR 1.8 BN in terms of funded balances for Leasing and Factoring, respectively. Piraeus had the largest Leasing exposure of the Group A Banks, with EUR 2.5 BN in total funded balances as well as the largest Factoring exposure with EUR 520 MM in total funded balances. NBG had the smallest Leasing portfolio, with a EUR 552 MM in total funded balances. Eurobank had the smallest Factoring portfolio with EUR 366 MM in total funded balances.

These specialised products are usually managed within the commercial banking division, even though they tend to be booked in separate subsidiaries. Considering that the types of collateral and management approach are similar to those observed for Corporate, SME or CRE loan portfolios, the modelling approach used by BlackRock was the same, and due diligence requests were covered in the Commercial RFI and due diligence sessions.

Figure 131: Overview of Group A Banks Leasing Portfolio[54]

		Alpha	Eurobank	NBG	Piraeus	Total
Portfolio Limits	Funded (€MM)	749	1,255	552	2,522	5,077
	Unfunded Committed (€MM)	0	0	0	6	6
	Unfunded Uncommitted (€MM)	0	103	36	0	139
	Total Limit (€MM)	749	1,358	588	2,528	5,223
Performance Status	Current (%)	63%	51%	60%	53%	55%
	Defaulted (%)	*37%*	*49%*	*40%*	*47%*	*45%*
	90+ dpd (%)	*37%*	*41%*	*37%*	*44%*	*42%*
	Denounced (%)	*22%*	*20%*	*24%*	*20%*	*21%*
Loss Mitigation	Current Modified (0-89 dpd, %)	*2%*	*17%*	*6%*	*28%*	*19%*
	Modified Defaulted (%)	*0%*	*27%*	*5%*	*27%*	*21%*
Security	Secured by Tangible Collateral (%)	*98%*	*99%*	*99%*	*90%*	*95%*
Loan Term	WA Remaining Term (years)	9.9	10.4	10.0	16.8	13.5

- The aggregate percentage of defaulted balances across all Group A Banks was approximately 45%, while loss mitigation was performed on 40% of the total universe.
- Piraeus had the highest percentage of 90+ loans at 44%
- Piraeus had the highest percentage of current modified loans at 28%
- The weighted average percentage of funded exposure secured by tangible collateral was 95% across all Group A Banks

[54] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

Figure 132: Overview of Group A Banks Factoring Portfolio[55]

		Alpha	Eurobank	NBG	Piraeus	Total
Portfolio Limits	Funded (€MM)	506	366	400	520	1,791
	Unfunded Committed (€MM)	0	0	0	0	0
	Unfunded Uncommitted (€MM)	0	51	0	422	473
	Total Limit (€MM)	506	417	400	942	2,265
Performance Status	Current (%)	96%	97%	98%	80%	92%
	Defaulted (%)	*4%*	*3%*	*2%*	*20%*	*8%*
	90+ dpd (%)	*2%*	*2%*	*0%*	*16%*	*6%*
	Denounced (%)	*0%*	*2%*	*0%*	*9%*	*3%*
Loss Mitigation	Current Modified (0-89 dpd, %)	*1%*	*0%*	*0%*	*0%*	*0%*
	Modified Defaulted (%)	*0%*	*0%*	*0%*	*0%*	*0%*
Security	Secured by Tangible Collateral (%)	*99%*	*100%*	*44%*	*100%*	*87%*

- The aggregate percentage of defaulted balances across all Group A Banks was approximately 8%, while loss mitigation was performed on 0% of the total universe
- Piraeus had the highest percentage of 90+ loans at 16% while NBG had the lowest percentage of 90+ loans at 0%
- The weighted average percentage of funded exposure secured by tangible collateral amounts to 87% across all Group A Banks. NBG had the lowest secured coverage percentage at 44%

9.2 Modelling Methodology

The BlackRock Leasing and Factoring modelling methodology follows the same ratings based expected loss approach used for Corporate exposures, which incorporates exposure at default ("EAD"), probability of default ("PD") and loss-given-default ("LGD") as the main parameters in estimating losses over time Credit loss projections ("CLP") are calculated as follows:

CLP = EAD * PD * LGD

The EAD and PD for Leasing and Factoring assets were calculated following the same methodology described for Corporate exposures as further described in Section 5.4.

BlackRock applied the same methodology to determine borrower level LGDs for Leasing and Factoring assets as for Corporate loans (described in Section 5.4).

[55] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

9.3 Group B Banks

9.3.1 Portfolio Stratifications

Figure 133: Group B Leasing Portfolio Stratifications[56]

		Aegean Baltic	Attica Bank	Credicom	Panellinia	Probank	Proton (Good Bank)	TT Hellenic Postbank	Total
Portfolio Limits	Funded (€MM)	0	307	0	37	187	42	0	571
	Unfunded Committed (€MM)	0	0	0	0	0	0	0	0
	Unfunded Uncommitted (€MM)	0	0	0	0	0	0	0	0
	Total Limit (€MM)	0	307	0	37	187	42	0	571
Performance Status	Current (%)	*0%*	*65%*	*0%*	*88%*	*46%*	*49%*	*0%*	*59%*
	Defaulted (%)	*0%*	*35%*	*0%*	*12%*	*54%*	*51%*	*0%*	*41%*
	90+ dpd (%)	*0%*	*0%*	*0%*	*12%*	*40%*	*16%*	*0%*	*15%*
	Denounced (%)	*0%*	*22%*	*0%*	*0%*	*21%*	*0%*	*0%*	*18%*
Loss Mitigation	Current Modified (0-89 dpd, %)	*0%*	*0%*	*0%*	*0%*	*12%*	*0%*	*0%*	*4%*
	Modified Defaulted (%)	*0%*	*0%*	*0%*	*0%*	*31%*	*0%*	*0%*	*10%*
Security	Secured by Tangible Collateral (%)	*0%*	*79%*	*0%*	*0%*	*93%*	*76%*	*0%*	*79%*
Loan Term	WA Remaining Term (years)	0.0	12.5	0.0	15.4	8.8	5.5	0.0	11.0

None of the Group B banks had any exposure classified as Factoring.

9.3.2 Methodology Overview

The Group B Leasing portfolio was modelled using the Group B PD/LGD methodology used for Corporates, which is described in detail in Section 5.5.2. As described in Section 9.3.1, none of the Group B banks had any exposure classified as Factoring.

[56] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

State-Related Exposures

10.1 Scope of Asset Quality Review

The Greek banking sector has significant exposure to loans that are intrinsically linked to the performance of the Greek State. As part of the Asset Quality Review for the Group A Banks, BlackRock reviewed, categorised and quantified the State-Related exposures of each Group A Bank by assessing the nature of the state support at the loan level.

In general, the BlackRock review covered the following areas:

i) Review and analysis of portfolio data submitted by the Banks, which were based on the specific State-Related categories as defined by BlackRock;
ii) On-site due diligence meetings held with Bank management with a focus on understanding the performance of State-Related exposures; and
iii) Large Loan underwriting for a sample of 12 borrowers totalling EUR 2.7 BN in funded exposure held across the Group A Banks

It should be noted that BlackRock does not express a view on the determination or ability of the Greek State to make payments on guaranteed exposures or to support state owned/affiliated entities. The assumptions made by BlackRock to derive the CLPs on State-Related loans have been provided by BoG, and do not express an opinion on the ability of the Greek State to meet its obligations, which is outside the scope of the Diagnostic Assessment. Similar to the 2011 Diagnostic, the main objective was to increase transparency into State-Related loans held by the Greek banking system by categorising and quantifying the different types of State-Related loans held by the Group A Banks.

Definition of State-Related Exposure Categories

BlackRock defined 3 distinct categories of State-Related exposures as described in the following table:

Figure 134: State-Related Categories

State-Related Categories	Description
1. Explicitly Guaranteed by the State 1a) Large Loan Guarantees 1b) Credit Support Programs ("CSPs")	1a) Loans to large state-owned companies or entities explicitly guaranteed by the State, as evidenced by a Joint Ministerial Decision ("KYA") 1b) Credit support programs to private sector entities guaranteed by ETEAN (ex-TEMPME) or directly from the State through a KYA decision • ETEAN is a vehicle set up by the Greek State that is mainly capitalised by GGBs to support working capital lending to SME and SBP borrowers by providing an 80% capital guarantee on qualifying loans • Direct KYA-covered CSPs generally receive 80-100% state guarantees
2. State Ownership/Affiliation	Loans to entities controlled and/or (partially) owned by the State, materially dependent on the State, or with some public purpose. Among other entities, these include partially State-owned utilities, public institutions, and local governments.

3. State-related Collateral	Loans secured by GGBs, subsidies, or other receivables from the State or State-related entities. Among others, these include loans to pharmaceutical companies secured by state hospital receivables and loans to construction companies secured by state subsidies.

Note: For the purposes of this report, the term "Public" exposure refers to loans in Categories 1a and 2 as defined in the table above.

Due Diligence

In the loan-level portfolio data templates sent to the Banks, BlackRock requested indicators to identify State-Related loans as of the Reference Date.

For each Group A Bank, BlackRock conducted two full-day due diligence sessions focused on commercial lending asset classes which included interviews with Bank management, relevant business-unit managers as well as the Bank's product, collateral management, risk and data specialists. These due diligence sessions included a specific section on State-Related exposures. The following topics were addressed during the interviews:

- Overview of different types and categories of State-Related loan exposures
- Description of the main characteristics or logic and criteria needed to identify State-Related exposures on the portfolio data tape submission as of 30 June 2013
- Discussion of the Banks' experience of managing and monetising state guarantees and State-Related collateral

10.2 Portfolio Overview of State Related Exposures

The Figure below contains an overview of key characteristics and risk metrics of State-Related exposure across the entire Group A Banks universe, side-by-side and relative to the Group A Bank average.

Figure 135: Summary of State-Related Exposures for Group A Banks (EUR MM)[57]

		Alpha	Eurobank	NBG	Piraeus	Total
Balances by Type	1a - Large Loan Guarantees (€MM)	266	2	350	160	778
	1b - Credit Support Programs (€MM)	385	126	56	829	1,396
	2 - State Ownership or Affiliation (€M	1,027	583	1,082	1,506	4,197
	3 - State Related Collateral (€MM)	444	527	1,231	1,232	3,434
	Total Balance (€MM)	2,121	1,238	2,720	3,726	9,805
Performance Status	Current (%)	*88%*	*80%*	*79%*	*72%*	*78%*
	Defaulted (%)	*12%*	*20%*	*21%*	*28%*	*22%*
	90+ dpd (%)	*11%*	*18%*	*13%*	*18%*	*15%*
	Denounced (%)	*5%*	*7%*	*5%*	*10%*	*7%*
Loss Mitigation	Current Modified (0-89 dpd, %)	*1%*	*3%*	*4%*	*6%*	*4%*
	Modified Defaulted (%)	*0%*	*1%*	*4%*	*7%*	*4%*
Security	Secured by Tangible Collateral (%)	*57%*	*58%*	*72%*	*71%*	*67%*
Loan Term	WA Remaining Term (years)	1.4	3.1	6.0	3.1	3.5

- The aggregate percentage of defaulted balances across all Group A Banks was approximately 22%, while loss mitigation was performed on 8% of the total universe

[57] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

- The weighted average percentage of funded exposure secured by tangible collateral amounts to 67% across all Group A Banks. NBG had the highest secured coverage, closely followed by Piraeus, while Alpha had the lowest secured coverage percentage across the Group A Banks
- The weighted average remaining term of Corporate loans was 3.5 years
- Piraeus was the Bank with the largest percentage of loss mitigation performed to-date. However, it is important to note that loss mitigation definitions and tracking policies are not entirely consistent across Banks. For example, it is important to note the following about Alpha's modification statistics:
    - Alpha does not maintain rescheduling information in its systems, which results in a systematic understatement of modified exposure at the Bank
    - While restructuring information is maintained for non-defaulted exposures (via a "Restructured" rating category), the flag is removed as soon as the exposure enters default. As a result, Modified Defaulted exposure is reported at 0%

Figure 136: Summary of State-Related Exposures for Group B Banks (EUR MM)[58]

		Aegean Baltic	Attica Bank	Credicom	Panellinia	Probank	Proton (Good Bank)	TT Hellenic Postbank	Total
Balances by Type	1a - Large Loan Guarantees (€MM)	0	0	0	0	0	0	50	50
	1b - Credit Support Programs (€MM)	0	0	0	0	37	0	0	37
	2 - State Ownership or Affiliation (€M	0	178	0	0	35	0	60	273
	3 - State Related Collateral (€MM)	0	0	0	56	238	4	4	301
	Total Balance (€MM)	0	178	0	56	310	4	114	662
Performance Status	Current (%)	*0%*	*100%*	*0%*	*40%*	*88%*	*9%*	*97%*	*88%*
	Defaulted (%)	*0%*	*0%*	*0%*	*60%*	*12%*	*91%*	*3%*	*12%*
	90+ dpd (%)	*0%*	*0%*	*0%*	*51%*	*5%*	*59%*	*3%*	*7%*
	Denounced (%)	*0%*	*0%*	*0%*	*18%*	*0%*	*0%*	*0%*	*2%*
Loss Mitigation	Current Modified (0-89 dpd, %)	*0%*	*0%*	*0%*	*8%*	*9%*	*0%*	*0%*	*5%*
	Modified Defaulted (%)	*0%*	*0%*	*0%*	*6%*	*4%*	*90%*	*0%*	*3%*
Security	Secured by Tangible Collateral (%)	*0%*	*2%*	*0%*	*21%*	*98%*	*96%*	*47%*	*57%*
Loan Term	WA Remaining Term (years)	0.0	3.5	0.0	0.0	7.4	0.0	2.9	2.9

The tables below provide name level detail on the largest Public sector borrowers (State-Related categories 1a and 2), the majority of which were reviewed as part of the Large Loan underwriting process.

Figure 137: Selected list of Borrowers under Category 1a - Large Loan Guarantees

Borrower Name	Ownership	Description
EAB		
Hellenic Aerospace Industry	99.6% owned by State	• Operates in the fields of co-production, repairs and maintenance of aircraft, and electronic systems • Owns 49% of Source Aerospace Services SA with Pratt & Whitney (51%) for the maintenance of turbine engines
DESFA		

[58] BlackRock used the following definitions for the Performance Status field: *Defaulted* is defined based on a combination of default flags from the data tapes, crossed at the borrower level, as further explained in Section 5.4; *90+* is defined as in arrears of 90 DPD or more; *Denounced* is defined as in legal status.

Borrower Name	Ownership	Description
Hellenic Gas Transmission System Operator	100% subsidiary of DEPA, the public natural gas supply corporation. DEPA is 65% owned by State and 35% by Hellenic Petroleum.	• Operates, maintains and manages the national natural gas system in Greece • The pipe system transports natural gas from the Greek-Turkish and Greek-Bulgarian borders and from the liquid natural gas station on Revithousa Island, to the company's retail clients • In June 2013, the sale of 66% of DESFA to SOCAR, an Azerbaijani oil company, was announced. The transaction is pending approval from Greek and European regulators.
KED		
Public Real Estate Corporation	100% state owned	• Manages State-owned real estate, responsible for construction and raising financing for new State-related buildings (e.g., ministries, police stations)
KEELPNO		
Centre for Disease Prevention	Under auspices of Ministry of Health	• Formed in 1992 under the auspices of Ministry of Health & Social Cohesion • Operations are subsidised from the state budget
STASY		
Urban Rail Transport	100% state owned	• Founded in June 2011, and incorporates the old ISAP (the urban rail line to Piraeus), AMEL (Athens metro) and Tram (Athens tram lines). The company employs 2,600 people.
OMMA		
Athens Music Megaron Organisation	Under the auspices of Ministry of Culture	• A non-profit organisation under the auspices of Ministry of Culture • Manages Athens's music hall that hosts various cultural and educational activities

Figure 138: Selected List of Borrowers under Category 2 - State Ownership/Affiliation

Borrower Name	Ownership	Description
DEH		
Public Power Corporation	Listed 51% state owned	• Largest electricity producer in Greece; generates, transmits, and distributes electricity • Owns the national distribution channel and 63 power generating stations. • Serves 7.5 MM customers
Egnatia Odos		
Egnatia Odos Motorway	100% state owned	• Responsible for the design, construction, financing, operation, maintenance and exploitation of the main corridor and vertical axes of Egnatia Odos motorway • The motorway spans to 670 KM in length at its main axis and another 290 KM in its vertical axes, from the eastern part of Northern Greece to the western borders with Turkey • Motorway impact zone covers 36% of Greece's population and 33% of Greece's GDP
ADMHE		

Borrower Name	Ownership	Description
Independent Power Transmission Operator **Peristeri**	100% subsidiary of DEH	• Operator of the high voltage electricity transmission network and provides maintenance to the low-voltage network, reimbursed by DEH • It charges a transmission system fee to electricity generators, which covers (a) its operating expenses (b) depreciations and (c) rate of return on the regulated asset base (RAV) • Privatisation plans are ongoing. It is expected that up to 66% will be sold to private investors and 34% retained by the Greek state with a target timeframe of H1 2014.
Municipality of Peristeri	Municipality	• Municipality in the Athens area, 4th most populous municipality in Greece • Revenues generated from direct state subsidies or local rates collected through PPC bills

10.3 Large Loan Underwriting and Model Approach

As part of the Large Loan underwriting exercise for the Group A Banks described in detail in Section 5.3, loan file reviews were conducted on 12 exposures characterised as State-Related. The analysis was extended to 7 other non-sampled exposures identified across the Group A Banks universe which were confirmed to be identical to the sampled exposures. The combined exposures represented EUR 3.7 BN in funded exposure equivalent to 83% coverage of the EUR 4.5 BN State-Related segment within the total Large Loan universe. The sample portfolio was selected by BlackRock to achieve a high percentage of notional coverage and to gain insight into the loan characteristics and state specific attributes of loans across each of the two categories of Public exposures (i.e., Categories 1a and 2). For details on the BlackRock underwriting team and process, please refer to Section 5.3.

Figure 139: Summary of State-Related Large Loan Underwriting

Bank	# Borrowers	Sample Funded Exposure (EUR MM)	Total Funded Exposure (EUR MM)	Percent Covered
Alpha	5	982	982	100%
Eurobank	3	433	506	86%
NBG	6	1,102	1,314	84%
Piraeus	5	1,208	1,665	73%
Total	***19***	***3,724***	***4,467***	***83%***

Specifically, the review covered the following topics:

- Nature of State affiliation or State dependency
- Evaluation of the underlying business, including current and historical operating performance
- Estimation of sustainable debt capacity on the basis of estimated free cash flow when financial statements were available
- Review of the capital structure and comparison of leverage to the estimated sustainable EBITDA and free cash flow and/or assessment of borrowers' dependency on state support to sustain current capital structure when financial statements were available

For the Category 1a exposures, our Large Loan underwriting concluded that nearly all borrowers in Category 1a required state support to sustain their debt levels and meet debt service obligations, and in certain cases, to fund ongoing working capital requirements. Based on the working assumption provided by the BoG, BlackRock

assumed no losses on loans in this category in all cases.

The majority of loans under Credit Support Programs (Category 1b) are either 80% or 100% guaranteed. Loans under CSPs were analysed using BlackRock's SME/SBP models Based on the assumption provided by the BoG, BlackRock assumed that the State will fully meet its obligations under the guarantees.

Category 2 exposures comprised loans to two main types of borrowers: those under State ownership, and those with State affiliation.

Bank exposure to borrowers under State ownership was almost entirely limited to utility companies, or Egnatia Odos. These borrowers mostly have profitable business models and/or relatively moderate level of indebtedness. Based on the assumption provided by the BoG, BlackRock assumed no losses on loans in this category in all cases.

State-affiliated borrowers included local government entities, utilities, public benefit organisations, pension funds and, to a smaller extent, universities, hospitals and other State-affiliated institutions. In general, these borrowers were financially dependent on state subsidies and did not produce detailed financial accounts. Based on the assumption provided by the BoG, BlackRock assumed no losses on loans in this category in all cases.

Finally, Category 3 loans were analysed using BlackRock's corporate model. For this category, all State-Related collateral submitted by the Banks were valued at face value, with no haircuts applied based on the assumption provided by the BoG.

Figure 140: Model Approach State-Related Loans

State-Related Categories	Assumption	Model approach
1. Explicitly Guaranteed		
1a) Large Loan Guarantees	No loss on loans backed by State guarantee	Override model to no default; no loss
1b) Credit Support Programs	No loss on the amount of the loan which is guaranteed by the State	If borrower defaults, no loss on guaranteed loan amount
2. State Ownership/Affiliation	No loss on loans	Override model to no default, no loss
3. State-Related Collateral	No haircut on State-Related collateral	Zero haircut applied to State-Related collateral

Appendix – Summary of Foreign Entity Submissions

Figure 141: Summary of Alpha's Foreign Branches and Subsidiaries Submissions

Alpha	Foreign Entity	Total Funded Bal. (EUR MM)	Greek Risk (EUR MM)	Foreign Risk (EUR MM)	Information Submitted
	Alpha Albania	264.66	0.22	264.43	Attestation letter
	Alpha Bulgaria	713.40	5.25	708.15	Loan data
	Alpha Cyprus	4,545.93	17.18	4,528.75	Loan data
	Alpha London Branch	1,423.40	310.93	1,112.47	Loan data
	Alpha London Ltd	518.23	250.00	268.23	Loan data
	Alpha Romania	2,873.38	0.14	2,873.24	Loan data
	Alpha Serbia	721.40	-	721.40	Attestation letter
	Alpha Skopje	69.37	0.01	69.37	Attestation letter
	Alpha Insurance Ltd (Cyprus)	0.78	-	0.78	Attestation letter
	Alpha Jersey	-	-	-	Attestation letter
	Alpha Leasing Romania	33.06	-	33.06	Attestation letter
	Emporiki Bank Cyprus	629.45	18.54	610.90	Loan data
Total		**11,793.06**	**602.27**	**11,190.78**	

Figure 142: Summary of Eurobank's Foreign Branches and Subsidiaries Submissions

Eurobank	Foreign Entity	Total Funded Bal. (EUR MM)	Greek Risk (EUR MM)	Foreign Risk (EUR MM)	Information Submitted
	Bancpost S.A.	1,682.57	-	1,682.57	Attestation letter
	Bulgarian Retail Services A.D.	347.34	-	347.34	Attestation letter
	ERB Leasing A.D. Belgrade	17.36	-	17.36	Attestation letter
	ERB Leasing E.A.D.	115.89	-	115.89	Attestation letter
	ERB Leasing IFN S.A.	77.27	-	77.27	Attestation letter
	ERB Retail Services IFN S.A.	148.59	-	148.59	Attestation letter
	Eurobank A.D. Belgrade	816.26	26.89	789.38	Loan data
	Eurobank Bulgaria A.D.	2,215.10	-	2,215.10	Attestation letter
	Eurobank Cyprus Ltd.	1,587.88	96.72	1,491.16	Loan data
	Eurobank Ergasias S.A.-London Branch	201.75	165.95	35.80	Loan data
	Eurobank Private Bank Luxembourg S.A.	1,492.24	720.35	771.89	Loan data
	IMO Property Investments Bucuresti S.A.	13.03	-	13.03	Attestation letter
	New Europe Funding	139.38	-	139.38	Attestation letter
	New Europe Funding II	598.73	-	598.73	Attestation letter
	New Europe Funding III	91.62	-	91.62	Attestation letter
	P.J.S.C. Universal Bank	430.38	-	430.38	Attestation letter
Total		**9,975.39**	**1,009.91**	**8,965.49**	

Figure 143: Summary of NBG's Foreign Branches and Subsidiaries Submissions

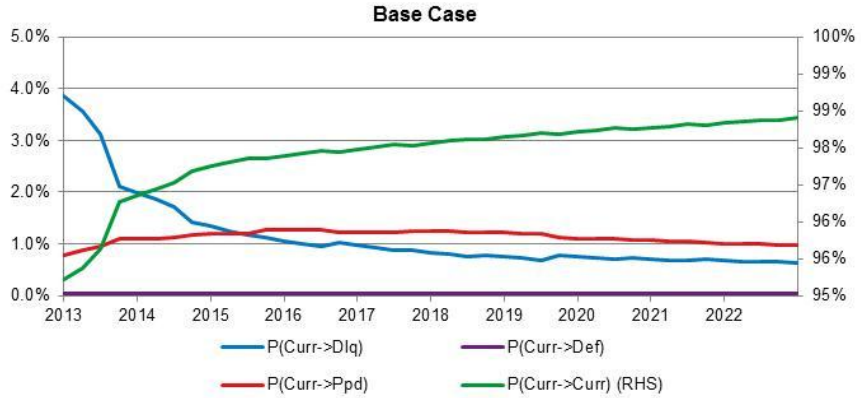
NBG	Foreign Entity	Total Funded Bal. (EUR MM)	Greek Risk (EUR MM)	Foreign Risk (EUR MM)	Information Submitted
	BROM	1,090.54	0.17	1,090.37	Loan data
	Interlease EAD (Bulgarian Leasing Subsidiary)	209.00	-	209.00	Attestation letter
	Egypt Branch	55.22	-	55.22	Attestation letter
	Finans Factoring	169.33	-	169.33	To submit Attest. letter
	Finans Invest	23.87	-	23.87	To submit Attest. letter
	Finans Leasing	631.80	-	631.80	To submit Attest. letter
	Finansbank	16,196.95	-	16,196.95	To submit Attest. letter
	NBG Leasing IFIN S.A. (Romania)	67.83	-	67.83	Attestation letter
	NBG Albania	215.47	-	215.47	Attestation letter
	NBG Cyprus Branch	164.01	5.02	158.99	Loan data
	NBG Cyprus Ltd	913.05	139.00	774.05	Loan data
	NBG Leasing Belgrade (Serbia)	48.70	-	48.70	Attestation letter
	NBG London Branch	1,691.69	309.91	1,381.78	Loan data
	NBG Malta	904.00	-	904.00	Attestation letter
	NBG Management Services Ltd	83.00	-	83.00	Attestation letter
	South African Bank of Athens	137.80	2.43	135.37	Loan data
	Stopanska Banka AD Skopje	849.23	-	849.23	Attestation letter
	UBB Factoring	8.59	-	8.59	Attestation letter
	United Bulgarian Bank	2,598.60	11.41	2,587.19	Loan data
	Vojvodjanska	618.93	36.72	582.21	Loan data
Total		**26,677.61**	**504.66**	**26,172.95**	

Figure 144: Summary of Piraeus' Foreign Branches and Subsidiaries Submissions

Piraeus	Foreign Entity	Total Funded Bal. (EUR MM)	Greek Risk (EUR MM)	Foreign Risk (EUR MM)	Information Submitted
	Frankfurt Branch	21.46	3.31	18.15	Loan data
	London Branch	2,971.16	303.29	2,667.87	Loan data
	Piraeus Bulgaria	1,307.76	16.89	1,290.87	Loan data
	Piraeus Cyprus	841.94	20.88	821.06	Loan data
	Piraeus Egypt	473.53	-	473.53	Attestation letter
	Piraeus Romania	1,582.48	-	1,582.48	Attestation letter
	Piraeus Ukraine	228.61	-	228.61	Attestation letter
	Piraeus Leasing Beograd	14.24	-	14.24	Attestation letter
	Piraeus Leasing Bulgaria	70.92	-	70.92	Attestation letter
	Piraeus Leasing Egypt	32.79	-	32.79	Attestation letter
	Piraeus Leasing Romania	128.94	-	128.94	Attestation letter
	Piraeus Beograd	417.63	0.43	417.20	Attestation letter
	Tirana Bank	362.16	0.39	361.77	Attestation letter
	Tirana Leasing	10.64	-	10.64	Attestation letter
Total		**8,464.26**	**345.19**	**8,119.07**	

Appendix – Retail

Figure 145: Base Case Transition Probabilities over Time (for NBG Residential)



Tobit Transformation (technical details)

Loss Severity is defined by the accounting relationship:

$$Loss\ Severity = max(-1 \cdot (S - B - X) / B,\ 0)$$

Where: S = liquidation sale price, B = balance upon liquidation, and X = brokerage, legal, and miscellaneous expenses. In other words, after selling the property, one uses the proceeds to pay down the remaining balance and incurred expenses. However, there is typically a shortfall, resulting in a loss. The ratio of that loss to the remaining balance is the Loss Severity.

Noting that S/B is the inverse of Indexed LTV ($ILTV^{-1}$), this is typically rearranged as:

$$Loss\ Severity = max(1 - ILTV^{-1} + x,\ 0)$$

Where x= X/B.

$ILTV^{-1}$ and x are both stochastic, so that Loss Severity is a censored random variable. In other words:

$$Loss\ Severity = E(\max(z, 0))$$

$$where\ z = 1 - ILTV^{-1} + x + \varepsilon$$

$$\text{and } \varepsilon \sim N(0, \sigma^2)$$

Due to censoring at 0, it is not the case that the expectation is simply the max(·) function by dropping the ε:

$$Loss\ Severity = E(\max(z, 0)) \neq \max(z, 0)$$

but rather:

$$Loss\ Severity = N\left(\frac{z}{\sigma}\right)\cdot z + \frac{\sigma}{\sqrt{2\pi}}\cdot exp^{\left(-0.5\left(\frac{z}{\sigma}\right)^2\right)}$$

Where N(.) denotes the Cumulative Standard Normal Distribution. The above equation is known as the Tobit transformation. It provides the exact solution for this mean under the assumption that z is Gaussian. For the Greek market specifically, σ has not been observed historically, so it must be a user-defined input. We set sigma at 20%, which is a standard assumption used for whole loan portfolio and RMBS collateral analysis in other jurisdictions.

To note due to the issues highlighted above, to obtain loss severity, one should not simply apply a liquidation assumption to a distressed indexed LTV projection.

Weighted Average Transition Matrices by Asset Class

Figure 146: Residential Mortgage (Non-Modified) Weighted Average Transition Matrix

		Time = t+1				
		Current	Delinquent	Default	Prepaid	Liquidated
Time = t	Current	97.2%	1.4%	0.1%	1.27%[1]	0.0%
	Delinquent	14.6%	60.7%	24.8%	0.0%	0.0%
	Default	0.9%	0.2%	92.7%	0.0%	6.3%[2]
	Prepaid	0.0%	0.0%	0.0%	100.0%	0.0%
	Liquidated	0.0%	0.0%	0.0%	0.0%	100.0%

1. Average based on Greek RMBS securitization data from 30/06/08 through 30/06/2013.
2. Steady state not reached until 2 (3) years after end of moratorium under base (adverse) scenario.
3. This is the average roll to delinquency for all modified loans. For Restructured loans this number is 22%. For Rescheduled loans, it is 11%, for loans ir
4. Only a negligible amount of cures were observed in the 5 year observation window. This is an assumption for future cures. Steady state is not reached

Figure 147: Residential Mortgage (Modified) Weighted Average Transition Matrix

		Time = t+1				
		Current	Delinquent	Default	Prepaid	Liquidated
Time = t	Current	82.4%	16.3%[3]	0.1%	1.27%[2]	0.0%
	Delinquent	4.1%	71.1%	24.8%	0.0%	0.0%
	Default	0.1%	0.1%	93.6%	0.0%	6.3%[1]
	Prepaid	0.0%	0.0%	0.0%	100.0%	0.0%
	Liquidated	0.0%	0.0%	0.0%	0.0%	100.0%

1. Average based on Greek RMBS securitization data from 30/06/08 through 30/06/2013.
2. Steady state not reached until 2 (3) years after end of moratorium under base (adverse) scenario.
3. This is the average roll to delinquency for all modified loans. For Restructured loans this number is 22%. For Rescheduled loans, it is 11%, for loans ir
4. Only a negligible amount of cures were observed in the 5 year observation window. This is an assumption for future cures. Steady state is not reached

Figure 148: Consumer Revolving Loan Weighted Average Transition Matrix

		Time = t+1				
		Current	Delinquent	Default	Prepaid	Liquidated
Time = t	Current	96.23%	3.77%	0.00%	0.00%	0.00%
	Delinquent	10.54%	13.68%	75.78%	0.00%	0.00%
	Default	1.00%[4]	0.00%	89.00%	0.00%	10.00%
	Prepaid	0.00%	0.00%	0.00%	100.00%	0.00%
	Liquidated	0.00%	0.00%	0.00%	0.00%	100.00%

1. Average based on Greek RMBS securitization data from 30/06/08 through 30/06/2013.
2. Steady state not reached until 2 (3) years after end of moratorium under base (adverse) scenario.
3. This is the average roll to delinquency for all modified loans. For Restructured loans this number is 22%. For Rescheduled loans, it is 11%, for loans ir
4. Only a negligible amount of cures were observed in the 5 year observation window. This is an assumption for future cures. Steady state is not reached

Figure 149: Consumer Auto Loan Weighted Average Transition Matrix

		Time = t+1				
		Current	Delinquent	Default	Prepaid	Liquidated
Time = t	Current	98.6%	1.2%	0.0%	0.3%	0.0%
	Delinquent	13.2%	24.9%	61.9%	0.0%	0.0%
	Default	1.0%[4]	0.0%	89.0%	0.0%	10.0%
	Prepaid	0.0%	0.0%	0.0%	100.0%	0.0%
	Liquidated	0.0%	0.0%	0.0%	0.0%	100.0%

1. Average based on Greek RMBS securitization data from 30/06/08 through 30/06/2013.
2. Steady state not reached until 2 (3) years after end of moratorium under base (adverse) scenario.
3. This is the average roll to delinquency for all modified loans. For Restructured loans this number is 22%. For Rescheduled loans, it is 11%, for loans ir
4. Only a negligible amount of cures were observed in the 5 year observation window. This is an assumption for future cures. Steady state is not reached

Figure 150: Consumer Term Loan (Non-Modified) Weighted Average Transition Matrix

		Time = t+1				
		Current	Delinquent	Default	Prepaid	Liquidated
Time = t	Current	94.6%	5.0%	0.0%	0.4%	0.0%
	Delinquent	8.6%	14.1%	77.3%	0.0%	0.0%
	Default	1.0%[4]	0.0%	91.5%	0.0%	7.5%
	Prepaid	0.0%	0.0%	0.0%	100.0%	0.0%
	Liquidated	0.0%	0.0%	0.0%	0.0%	100.0%

1. Average based on Greek RMBS securitization data from 30/06/08 through 30/06/2013.
2. Steady state not reached until 2 (3) years after end of moratorium under base (adverse) scenario.
3. This is the average roll to delinquency for all modified loans. For Restructured loans this number is 22%. For Rescheduled loans, it is 11%, for loans ir
4. Only a negligible amount of cures were observed in the 5 year observation window. This is an assumption for future cures. Steady state is not reached

Figure 151: Consumer Term Loan (Modified) Weighted Average Transition Matrix

		Time = t+1				
		Current	Delinquent	Default	Prepaid	Liquidated
Time = t	Current	82.3%	16.3%	1.0%	0.4%	0.0%
	Delinquent	4.0%	13.5%	82.5%	0.0%	0.0%
	Default	1.0%[4]	0.0%	91.5%	0.0%	7.5%
	Prepaid	0.0%	0.0%	0.0%	100.0%	0.0%
	Liquidated	0.0%	0.0%	0.0%	0.0%	100.0%

1. Average based on Greek RMBS securitization data from 30/06/08 through 30/06/2013.
2. Steady state not reached until 2 (3) years after end of moratorium under base (adverse) scenario.
3. This is the average roll to delinquency for all modified loans. For Restructured loans this number is 22%. For Rescheduled loans, it is 11%, for loans ir
4. Only a negligible amount of cures were observed in the 5 year observation window. This is an assumption for future cures. Steady state is not reached

Figure 152: SBP Loans Weighted Average Transition Matrix (non-Modified loans)

		Time = t+1				
		Current	Delinquent	Default	Prepaid	Liquidated
Time = t	Current	95.8%	4.1%	0.0%	0.125%[1]	0.0%
	Delinquent	10.6%	64.2%	25.1%	0.125%[2]	0.0%
	Default	0.0%	0.2%	94.8%	0.0%	5.00%[2]
	Prepaid	0.0%	0.0%	0.0%	100.0%	0.0%
	Liquidated	0.0%	0.0%	0.0%	0.0%	100.0%

[1] Average based on historical data supplied by Banks
[2] Steady state not reached until 2 (3) years after end of moratorium under base (adverse) scenario

Figure 153: SBP Loans Weighted Average Transition Matrix (Modified loans)

		Time = t+1				
		Current	Delinquent	Default	Prepaid	Liquidated
Time = t	Current	77.7%	22.2%	0.0%	0.125%[1]	0.0%
	Delinquent	2.8%	70.0%	27.1%	0.125%[2]	0.0%
	Default	0.0%	0.2%	94.8%	0.0%	5.00%[2]
	Prepaid	0.0%	0.0%	0.0%	100.0%	0.0%
	Liquidated	0.0%	0.0%	0.0%	0.0%	100.0%

[1] Average based on historical data supplied by Banks
[2] Steady state not reached until 2 (3) years after end of moratorium under base (adverse) scenario

Complete Suite of Transition Explanatory Variables by Asset Class

Figure 154: Modified Residential Mortgage Current to Default Transition Explanatory Variables

Prob (Current->Delinquent) Modified Loans	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Indexed LTV	1	+	520.4	1%
ln(Loan Age+1)	2	+	214.3	1%
Loan Age	3	-	213.8	1%
Loan Coupon	4	+	120.0	1%
Δ in Real GDP (Year on Year)	5	-	59.5	1%
Modification = Rescheduled (Restructured in intercept)	A	-	696.6	1%
Modification = Forbearance (Restructured in intercept)	B	-	306.8	1%
Employment Status Categories	C	dependent on category	161.0	1%
Fixed Coupon (0,1)	D	-	90.9	1%
Borrower Location Categories	E	dependent on category	26.4	1%
Purchase Loan (0,1)	F	-	22.1	1%
Flexible Loan (0,1)	G	-	19.3	1%
Interest Only Loan (0,1)	H	-	12.0	1%
Other (non-govt) Guaranteed Loan (0,1)	I	-	9.2	1%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories

Figure 155: Non-Modified Residential Mortgage Current to Default Transition Explanatory Variables

Prob (Current->Default) Non-Modified Loans	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Intercept only	n/a	n/a	n/a	n/a

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories

Figure 156: Residential Mortgage Current to Prepayment Transition Explanatory Variables

Prob (Current->Prepayment)	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
ln(Loan Age+1)	1	+	8.0	1%
Rate Incentive = Loan Coupon / Prevailing Rate on New Lending	2	+	5.6	5%
Loan Age	3	-	3.2	10%
Δ in Unemployment (Year on Year)	4	-	3.1	10%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories

Figure 157: Residential Mortgage Delinquent to Current Transition Explanatory Variables

Prob (Delinquent->Current)	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Δ in Unemployment (Year on Year)	1	-	51.1	1%
ln(Loan Age+1)	2	+	35.8	1%
Indexed LTV	3	-	26.0	1%
Loan Age	4	-	16.3	1%
Government Guaranteed Loan (0,1)	A	+	347.5	1%
Employment Status Categories	B	dependent on category	58.3	1%
Other (non-govt) Guaranteed Loan (0,1)	C	-	41.4	1%
Modification = Restructured	D	-	23.6	1%
OEK Qualified Loan (0,1)	E	-	18.7	1%
CHF Denominated Loan (0,1)	F	+	13.5	1%
Purchase Loan (0,1)	G	-	9.6	1%
Fixed Coupon (0,1)	H	-	8.1	1%
Borrower Location Categories	I	dependent on category	6.8	1%
Interest Only Loan (0,1)	J	-	3.7	10%
Flexible Loan (0,1)	K	+	3.3	10%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories

Figure 158: Residential Mortgage Delinquent to Default Transition Explanatory Variables

Prob (Delinquent->Default)	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
ln(Loan Age+1)	1	+	431.4	1%
Loan Coupon	2	+	304.9	1%
Loan Age	3	-	302.9	1%
Indexed LTV	4	+	69.0	1%
Δ in Real GDP (Year on Year)	5	-	12.1	1%
Δ in Unemployment (Year on Year)	6	+	10.2	1%
Other (non-govt) Guaranteed Loan (0,1)	A	-	161.6	1%
Modification = Rescheduled	B	+	103.1	1%
Modification = Restructured	C	+	50.4	1%
OEK Qualified Loan (0,1)	D	-	34.0	1%
Government Guaranteed Loan (0,1)	E	-	25.3	1%
Interest Only Loan (0,1)	F	+	23.9	1%
CHF Denominated Loan (0,1)	G	+	17.9	1%
Employment Status Categories	H	dependent on category	17.3	1%
Borrower Location Categories	I	dependent on category	16.4	1%
Flexible Loan (0,1)	J	-	8.1	1%
Fixed Coupon (0,1)	K	-	7.4	1%
Purchase Loan (0,1)	L	-	4.1	5%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories

Figure 159: Residential Mortgage Default to Current Transition Explanatory Variables

Prob (Default->Current)	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
ln(Loan Age+1)	1	-	1,890.0	1%
Δ in Real GDP (Year on Year)	2	+	1,729.4	1%
Δ in Unemployment (Year on Year)	3	-	656.9	1%
Indexed LTV	4	-	334.0	1%
Loan Age	5	+	109.8	1%
Modification = Rescheduled	A	-	48.7	1%
Modification = Restructured	B	-	38.4	1%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories

Figure 160: Residential Mortgage Default to Delinquent Transition Explanatory Variables

Prob (Default->Delinquent)	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Loan Age	1	+	163.1	1%
Δ in Unemployment (Year on Year)	2	-	103.6	1%
Δ in Real GDP (Year on Year)	3	+	77.4	1%
Indexed LTV	4	-	15.3	1%
ln(Loan Age+1)	5	-	6.6	5%
Modification = Restructured	n/a	-	104.0	1%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories

Figure 161: Consumer Modified Term Loan Current to Delinquent Transition Explanatory Variables

Prob(Current->Delinquent) (Modified Loans)	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Δ in Unemployment (Year on Year)[3]	n/a	+	n/a	n/a
Δ in Real GDP (Year on Year)[3]	n/a	-	n/a	n/a
ln(Loan Age+1)	1	+	1,329.0	1%
Loan Age	2	-	1,199.6	1%
Loan Coupon	3	+	272.4	1%
Modification = Rescheduled (Restructured in intercept)	A	-	4,100.2	1%
Interest Only Loan (0,1)	B	-	1,081.2	1%
Modification = Forbearance (Restructured in intercept)	C	-	689.8	1%
Mortgage Backed (0,1)	D	+	258.3	1%
Fixed Coupon (0,1)	E	+	250.8	1%
Employment Status Categories	F	dependent on category	201.2	1%
Borrower Location Categories	G	dependent on category	55.6	1%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories
3. These macro factors had their estimates bounded to be no less than the fitted effect observed for non-modified term loans
4. A number of factors were kept oin the model despite not being statistically signigicant because the influence, although directionally weak, was economically intuitive

Figure 162: Modified Term Loan Current to Default Transition Explanatory Variables

Prob(Current->Default) (Modified Loans)	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
z = logit from Prob(Curr->DLQ) transition	n/a	+	194.6	1%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories

Figure 163: Consumer Non-Modified Term Loan Delinquent to Current Transition Explanatory Variables

Prob(Delinquent->Current) (Non-Modified Loans)[3]	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Loan Coupon	1	-	273.6	1%
ln(Loan Age+1)	2	-	39.4	1%
Loan Age	3	+	14.5	1%
Employment Status Categories	A	dependent on category	50.7	1%
Dixon Loan (0,1)	B	+	18.8	1%
Interest Only Loan (0,1)	C	+	2.5	>10%
Borrower Location Categories	D	dependent on category	1.8	>10%
Green Loan (0,1)	E	+	0.4	>10%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories
3. These macro factors had their estimates bounded to be no less than the fitted effect observed for non-modified term loans

Figure 164: Consumer Non-Modified Term Loan Delinquent to Default Transition Explanatory Variables

Prob(Delinquent->Default) (Non-Modified Loans)	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
ln(Loan Age+1)	1	-	211.5	1%
Δ in Unemployment (Year on Year)	2	+	84.7	1%
Δ in Real GDP (Year on Year)	3	-	25.7	1%
Dixon Loan (0,1)	A	-	74.6	1%
Fixed Coupon (0,1)	B	+	49.8	1%
Employment Status Categories	C	dependent on category	19.0	1%
Borrower Location Categories	D	dependent on category	11.2	1%
Green Loan (0,1)	E	-	7.5	1%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories

Figure 165: Consumer Modified Term Loan Delinquent to Current Transition Explanatory Variables

Prob(Delinquent->Current) (Modified Loans)[3]	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Loan Coupon	1	-	0.6	>10%
ln(Loan Age+1)	2	+	0.2	>10%
Loan Age	3	-	0.2	>10%
Δ in Real GDP (Year on Year)	4	+	0.0	>10%
Modification = Rescheduled (Restructured in intercept)	A	+	9.0	1%
Fixed Coupon (0,1)	B	-	2.7	>10%
Modification = Forbearance (Restructured in intercept)	C	+	1.3	>10%
Borrower Location Categories	D	dependent on category	1.3	>10%
Employment Status Categories	E	dependent on category	1.2	>10%
Mortgage Backed (0,1)	F	-	1.1	>10%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories
3. A number of factors were kept oin the model despite not being statistically signigicant because the influence, although directionally weak, was economically intuitive

Figure 166: Consumer Modified Term Loan Delinquent to Default Transition Explanatory Variables

Prob(Delinquent->Default) (Modified Loans)[3]	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Loan Coupon	1	+	32.6	1%
Loan Age	2	-	14.7	1%
ln(Loan Age+1)	3	-	9.6	1%
Δ in Real GDP (Year on Year)	4	-	6.2	5%
Modification = Rescheduled (Restructured in intercept)	A	-	229.1	1%
Fixed Coupon (0,1)	B	+	78.0	1%
Employment Status Categories	C	dependent on category	25.1	1%
Mortgage Backed (0,1)	D	+	7.4	1%
Borrower Location Categories	E	dependent on category	3.7	10%
Interest Only Loan (0,1)	F	-	2.8	10%
Modification = Forbearance (Restructured in intercept)	G	+	1.6	>10%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories
3. A number of factors were kept oin the model despite not being statistically signigicant because the influence, although directionally weak, was economically intuitive

Figure 167: Consumer Revolving Loan Current to Delinquent Transition Explanatory Variables

Prob (Current->Delinquent)[4]	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Δ in Unemployment (Year on Year)[3]	n/a	+	n/a	n/a
Δ in Real GDP (Year on Year)[3]	n/a	-	n/a	n/a
Loan Coupon	1	+	8,588.2	1%
ln(Loan Age+1)	2	+	4,179.6	1%
Loan Age	3	-	1,971.8	1%
Original Credit Limit	4	-	0.7	>10%
Fixed Coupon (0,1)	A	-	12,881.1	1%
Employment Status Categories	B	dependent on category	1,453.1	1%
Overdraft Loan (0,1)	C	-	1,283.0	1%
Borrower Location Categories	D	dependent on category	577.7	1%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories
3. These macro factors had their estimates bounded to be no less than the fitted effect observed for non-modified term loans
4. A number of factors were kept oin the model despite not being statistically signigicant because the influence, although directionally weak, was economically intuitive

Figure 168: Consumer Revolving Loan Delinquent to Current Transition Explanatory Variables

Prob (Delinquent->Current)[3]	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
ln(Loan Age+1)	1	-	7.4	1%
Loan Coupon	2	-	0.3	>10%
Employment Status Categories	A	dependent on category	5.4	**
Overdraft Loan (0,1)	B	+	4.5	**
Borrower Location Categories	C	dependent on category	3.9	**
Fixed Coupon (0,1)	D	+	0.7	>10%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories
3. A number of factors were kept oin the model despite not being statistically signigicant because the influence, although directionally weak, was economically intuitive

Figure 169: Consumer Revolving Loan Delinquent to Default Transition Explanatory Variables

Prob (Delinquent->Default)	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Original Credit Limit	1	-	678.5	1%
Δ in Real GDP (Year on Year)	2	-	22.6	1%
ln(Loan Age+1)	3	+	10.7	1%
Δ in Unemployment (Year on Year)	4	+	9.4	1%
Loan Age	5	-	9.2	1%
Loan Coupon	6	+	2.9	10%
Overdraft Loan (0,1)	A	-	84.9	1%
Borrower Location Categories	B	dependent on category	29.0	1%
Employment Status Categories	C	dependent on category	2.7	10%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories

Figure 170: Consumer Auto Loan Current to Delinquent Transition Explanatory Variables

Prob (Current->Delinquent)[4]	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
Δ in Unemployment (Year on Year)	n/a	+	n/a	n/a
Δ in Real GDP (Year on Year)[3]	n/a	-	n/a	n/a
Loan Coupon	1	+	10,103.4	1%
Loan Age	2	+	315.2	1%
ln(Loan Age+1)	3	+	214.2	1%
Fixed Coupon (0,1)	A	+	3,741.2	1%
Modification = Restructured	B	+	1,384.2	1%
Employment Status Categories	C	dependent on category	454.1	1%
Modification = Rescheduled	D	+	287.5	1%
Borrower Location Categories	E	dependent on category	211.4	1%
Interest Only Loan (0,1)	F	+	0.1	>10%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories
3. These macro factors had their estimates bounded to be no less than the fitted effect observed for non-modified term loans
4. A number of factors were kept oin the model despite not being statistically signigicant because the influence, although directionally weak, was economically intuitive

Figure 171: Consumer Auto Loan Delinquent to Current Transition Explanatory Variables

Prob (Delinquent->Current)[3]	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
ln(Loan Age+1)	n/a	+	0.0	>10%
Fixed Coupon (0,1)	A	-	9.0	1%
Employment Status Categories	B	dependent on category	0.7	>10%
Borrower Location Categories	C	dependent on category	0.5	>10%
Interest Only Loan (0,1)	D	-	0.1	>10%
Modification = Restructured	E	-	0.0	>10%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories
3. A number of factors were kept oin the model despite not being statistically signigicant because the influence, although directionally weak, was economically intuitive

Figure 172: Consumer Auto Loan Delinquent to Default Transition Explanatory Variables

Prob (Delinquent->Default)[3]	Factor Rank[1]	Direction of Correlation	Chi-Square Statistic[2]	Significance
ln(Loan Age+1)	1	-	2.4	>10%
Δ in Unemployment (Year on Year)	2	+	0.3	>10%
Loan Age	3	+	0.2	>10%
Employment Status Categories	A	dependent on category	8.9	1%
Borrower Location Categories	B	dependent on category	0.4	>10%
Fixed Coupon (0,1)	C	+	0.2	>10%

1. Continuous variable rank denoted in numerical order; categorical variable rank denoted in alphabetical order
2. For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories
3. A number of factors were kept oin the model despite not being statistically signigicant because the influence, although directionally weak, was economically intuitive

Figure 173: SBP Loans Current to Delinquent (non-Modified loans) Transition Explanatory Variables

Prob(Current->Delinquent) Non-Modified loans	Factor Rank[1]	Direction of Correlation	Chi-Sqr Statistic[2]	Significance[3]
ln(Loan Age)	1	+	1,760.7	1%
Δ Unemployment	2	+	1,018.8	1%
Δ GDP	3	-	503.4	1%
Payment Type	A	-	7,923.2	1%
Physical Borrower	B	+	1,572.5	1%
Revolving Loan	C	+	1,456.8	1%
Business Sector	D	dependent on category	339.9	1%
Government Guarantee Flag	E	-	86.1	1%

[1] Continuous Rank = 1, 2, 3, 4… Categorical Rank= A, B, C, D…

[2] For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories.

Figure 174: SBP Loans Current to Delinquent (Modified loans) Transition Explanatory Variables

Prob(Current->Delinquent) Modified loans	Factor Rank[1]	Direction of Correlation	Chi-Sqr Statistic[2]	Significance[3]
ln(Loan Age)	1	+	3,424.2	1%
Loan Age	2	-	1,482.8	1%
Δ Unemployment	3	+	314.4	1%
Loan Coupon	4	+	62.0	1%
Δ GDP	5	-	53.7	1%
Guarantor Flag	A	+	822.0	1%
Government Guarantee Flag	B	-	243.3	1%
Revolving Loan	C	+	175.5	1%
Payment Type	D	-	124.9	1%
Business Sector	E	dependent on category	99.8	1%
Region Islands	F	-	33.9	1%
Physical Borrower	G	+	32.2	1%

[1] Continuous Rank = 1, 2, 3, 4… Categorical Rank= A, B, C, D…

[2] For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories.

Figure 175: SBP Loans Delinquent to Current Transition Explanatory Variables

Prob(Delinquent->Current)	Factor Rank[1]	Direction of Correlation	Chi-Sqr Statistic[2]	Significance[3]
Δ Unemployment	1	-	55.0	1%
Δ GDP	2	+	50.6	1%
Payment Type	A	+	294.6	1%
Loan Modification Flag	B	-	107.6	1%
Revolving Loan	C	-	47.4	1%
Business Sector	D	dependent on category	43.2	1%
Government Guarantee Flag	E	+	42.0	1%
Physical Borrower	F	-	28.9	1%
Region Athens	G	-	22.7	1%
Guarantor Flag	H	+	13.4	1%
First Lien Collateral	I	+	5.5	10%

[1] Continuous Rank = 1, 2, 3, 4… Categorical Rank= A, B, C, D…

[2] For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories.

Figure 176: SBP Loans Delinquent to Default Transition Explanatory Variables

Prob(Delinquent->Default)	Factor Rank[1]	Direction of Correlation	Chi-Sqr Statistic[2]	Significance[3]
ln(Loan Age)	1	+	499.4	1%
Loan Age	2	-	290.3	1%
Loan Coupon	3	-	248.3	1%
Δ GDP	4	-	42.8	1%
ln(Loan Balance)	5	+	23.2	1%
Loan Modification Flag	A	+	262.4	1%
Revolving Loan	B	-	133.7	1%
Business Sector	C	dependent on category	53.1	1%
Guarantor Flag	D	+	41.0	1%
Government Guarantee Flag	E	-	9.7	5%

[1] Continuous Rank = 1, 2, 3, 4… Categorical Rank= A, B, C, D…

[2] For categorical variables with n>2 categories, the maximum Chi-Squared statistic of the invividual effects is reported, representing a lower bound of the joint significance of the combined categories.

Figure 177: SBP Loans Default to Delinquent Transition Explanatory Variables

Prob(Default->Delinquent)	Factor Rank[1]	Direction of Correlation	Chi-Sqr Statistic	Significance
Δ Unemployment	1	-	33.5	1%
Δ GDP	2	+	31.3	1%

[1] Continuous Rank = 1, 2, 3, 4… Categorical Rank= A, B, C, D…